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The Week at a Glance

CARLOADINGS: In the July 23 week freight cars loaded totaled 581 thousand, 24.3 per cent under last year.

RED INK FOR MAY: In May the Class I roads were 25½ millions in the red, after allowing for fixed charges. Since the first of the year the "profit" earned by railway stockholders has been a minus quantity, so far totaling 165 millions (as contrasted with a black figure of 20½ millions for the first five months of 1937).

TRUCKS THREATEN SPEED: The I. C. C.'s ruling limiting truck drivers to 10 hours' driving a day will decrease safety rather than increase it—such is the somewhat amazing conclusion of our esteemed trucking contemporary "Transport Topics." And this is how the truck organ's argument goes—truck runs are now set up to work drivers 11 or 12 hours a day. With the limit on working hours, the trucks will have to be speeded up, to cover in 10 hours the routes they now traverse in 12 hours. Hence, greater speed and less safety. The expedient of stopping a truck midway in a 300-mile run and having a new driver take over the wheel does not seem to have occurred to the master minds of "flexible transportation."

EARNINGS, 0.67%: The railroads in the first half of the current year had earnings at the rate of ⅔ of 1 per cent on their capital investment—the total net railway operating income being 70¼ millions, as against 299½ millions (2.84 per cent on the investment) in the first half of last year.

"DIVERSION" BALLYHOO: Although the New York State Constitutional Convention punctured the oil, road-building and motor industries' propaganda for a constitutional amendment against gas tax "diversion" for other than highway purposes, these special-privilege lobbyists are having better luck in other states. In Michigan, New Hampshire, California and Alabama they have succeeded in getting anti-"diversion" amendments before the people, to be voted on at the fall elections. And, having set such a brave example of self-reliance, some business men wonder why organized labor, the unemployed and the farmers should be so low-down as to resort to political means to secure special privileges for themselves.

R. F. C. LOANS: Jesse Jones this week revealed that, subject to I. C. C. approval, the R. F. C. is prepared to make a \$5,000,000 "work loan" to the N. Y. C. and a loan of \$9,500,000 to finance the merger of the G. M. & N. and the M. & O.

SMART UNION TACTICS: The ability and the zeal of the leaders of the organized railway employees in advancing the interests of the members who pay their

salaries is exemplified by the decline of 46 per cent in railway jobs since 1929. The leading editorial herein analyzes this "victory" and points out how the same union policies are threatening to force the abandonment of thousands of miles of railway line and, consequently, sacrifice the jobs of further thousands of railway employees.

NEW "CITY OF L. A." CARS: The streamliner "City of Los Angeles" has had its consist of revenue equipment raised from 9 to 11, a chair car and an all-room sleeping car being added.

CUT PAY OR QUIT: This is the ultimatum Federal Judge Howe has handed down to employees of the Rutland. He made out a schedule of reductions from 10 to 30 per cent, depending on the employee's average earnings, and stipulated that the deduction would not become a prior lien on railroad earnings. Any employee who does not like the reduction is privileged to quit working, is the advice of Judge Howe. The court has thanked Receiver Morphy and other officers for accepting a wage reduction of 56 per cent, and has thanked "other persons who are making large gifts of money and wonderful efforts to keep the road running." A novel plan of traffic development through a "co-operating traffic association" has been proposed and a drive for subscriptions is under way.

RAIL-AUTO HOOK-UP: The New Haven has made arrangements with a "drive yourself" automobile renting service whereby its passengers may hire automobiles at reduced rates. The purpose of the plan is to attract to the railroad, commercial travelers now using automobiles, not because they like to drive, but because they need motor cars to get around in at the cities they visit.

HIGH SPEED BRAKING: Tests to determine the effectiveness of brake shoes at high speeds and with high pressures are described with charts in an article in this issue. The data have a practical bearing on modern railroading because of present day high speeds and the fact a *drastic change takes place in the behavior of brake shoe material when speed exceeds 60 m.p.h. and shoe pressures greater than 15,000 lb. are applied.*

DENVER LABORATORY: The testing laboratory of the D. & R. G. W. at Denver—a novel project for a road of this size—is described in an illustrated article herein. Facilities are provided for testing a wide variety of materials to assure their conformance to specifications—and also for the development of higher standards for the future. The building and all its appointments are strictly utilitarian; and the article names the principal testing equipment employed. A highly-qualified staff of technicians is in charge.

EXIT S. E. EXPRESS: Railway Express Agency took over the operation of the Southeastern Express on August 1, thus becoming the sole company providing express service in the United States.

WHITNEY vs. LEWIS: The New York Times has drawn attention to A. F. Whitney's statement that: "We will not take a cut; the fact that the railroads haven't the money is not our problem," contrasting it with John L. Lewis' insistence on protecting the coal industry's earnings. The concern of Sidney Hillman of the Amalgamated Clothing Workers for the profitability of that industry is likewise cited as evidence that "the strong common sense of American labor" recognizes "the essential interests that workers and employers share in common." If Lewis and Hillman are showing common sense, what kind of sense is Mr. Whitney showing? A look at the figures of railway employment under the dominance of the Whitney type of leadership will give a rough idea.

MECHANICAL MEETINGS: Most of the railway association conventions during the present year have been cancelled—and, strictly speaking, the same is true of the "minor" mechanical associations. However, "open" committee meetings of these associations will be held in Chicago on September 27-28, which may be attended by members who are not committee members; and regular reports will be presented by the committees of some of the associations.

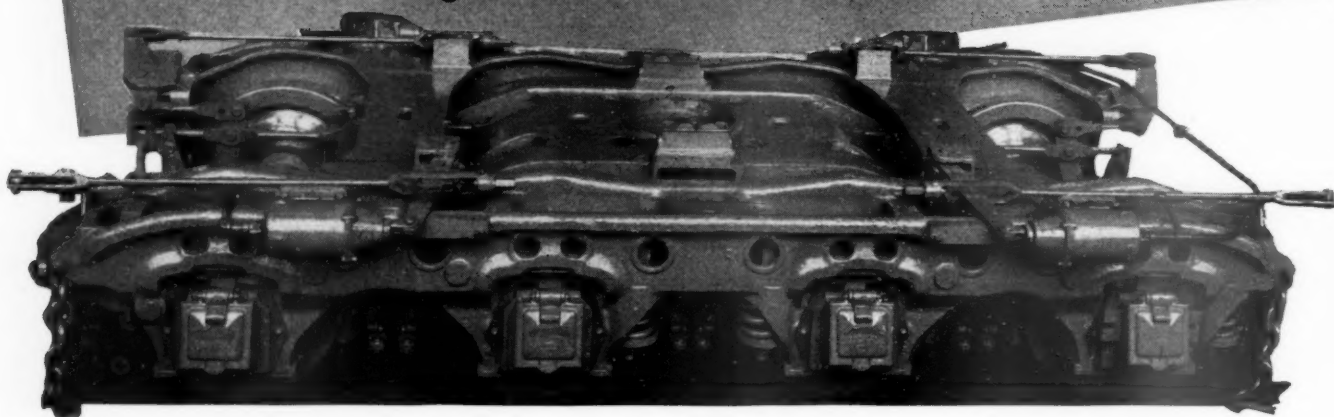
RAILROAD FILMS: There is a selection of 214 different films on railroad subjects available for showing at meetings of clubs and other gatherings—and most of these films are to be had free of charge. The publicity office of the A. A. R. has compiled the list and distributed it among member roads, telling what the films are about and how they may be borrowed.

AND NOW MEDIATION: The railroads and the B. of R. T. have agreed to disagree over the proposal for a 15 per cent wage cut and the good offices of a federal mediator have been asked. At the time of going to press the Railway Labor Executives Association had not finished putting in its case against the proposed reduction—but indications were that this part of the wage case also would go to mediation by the beginning of next week.

PROTEST C & D CHARGE. A New York Central local of the Brotherhood of Railroad Clerks has asked the I. C. C. to prevent that road from levying a charge for collection and delivery service, as it proposes, contending that the innovation may injure N. Y. C. employment. A Gardner, Mass., shipper has likewise protested against the assessment of such a charge by the B. & M., claiming that its competitors on other railroads will thus be given an unfair advantage.

SIMPLEX

Unit Cylinder CLASP BRAKES ... on 8-wheel trucks



New locomotives built for the Atlantic Coast Line R. R. by Baldwin, have 8-wheel tender trucks equipped with Simplex Unit Cylinder Clasp Brakes.

Four brake cylinders are located on each truck frame . . . a construction that permits free movement of trucks. Insures safe and dependable operation.

Simplex Unit Cylinder Clasp Brakes are designed to produce efficient braking and rapid deceleration, and are standard for new power and equipment.

The lead trucks of these Atlantic Coast Line locomotives ride on A. S. F. Roller Bearing Units.

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RAILWAY AGE

How Much "Purchasing Power" Does an Abandoned R. R. Provide?

While the railway labor executives and some New Deal politicians are contending that railway wage rates should be maintained at present unprecedentedly high levels to maintain labor's "purchasing power," a situation has developed in Vermont which puts the validity of their "purchasing power" theory to the acid test. The Rutland Railroad is in serious financial straits. "Overcapitalization" is not an issue, because the railroad is paying nothing whatsoever to its investors. So putting the property "through the wringer" (which is the only alternative to a wage reduction that the labor executives have suggested), won't help any. The problem is to keep the road in operation at all when the money taken in from its customers has been running \$2400 a day less than its bare operating expenses and taxes. Public attention could profitably be directed to the Rutland, because it illustrates in microcosm what is happening to the railroad industry in the large.

Is the Rutland "Typical"?

The committee of railway managers negotiating with the labor organizations for a decrease in wages called their attention to the Rutland situation, whereupon A. F. Whitney, president of the Brotherhood of Railroad Trainmen, protested that the Rutland is "not typical." He is, unfortunately, badly mistaken. In its failure to earn enough money to pay operating expenses and taxes, the Rutland is in illustrious company. In the first five months of the current year approximately half of the Class I railroads, operating 124,538 miles or more than one-half of the country's total mileage, failed to earn enough to cover their operating expenses and taxes. The Rutland, therefore, is all-too-typical. The other railroads which in the first five months of the current year joined it in its failure to meet expenses included the following:

Akron, Canton & Youngstown
Alton
Atchison, Topeka & Santa Fe
Atlanta & West Point
Western of Alabama
Atlanta, Birmingham & Coast
Staten Island Rapid Transit
Bessemer & Lake Erie
Burlington-Rock Island
Canadian Pacific Lines in Vt.
Central of Georgia
Central Vermont
Chicago & Eastern Illinois
Chicago & North Western
Chicago Great Western
Chicago, Indianapolis & Louisville
Chicago, Milwaukee, St. Paul & Pacific
Chicago, Rock Island & Pacific
Chicago, Rock Island & Gulf

Gulf & Ship Island
Lake Superior & Ishpeming
Louisiana, Arkansas & Texas
Minneapolis, St. Paul & Sault Ste Marie
Duluth, South Shore & Atlantic
Spokane International
Mississippi Central
Missouri & Arkansas
Missouri-Kansas-Texas Lines
International Great Northern
New York Central
New York, New Haven & Hartford
New York, Ontario & Western
Norfolk Southern
Northwestern Pacific
Northern Pacific
Long Island
Pennsylvania-Reading Seashore Lines

Chicago, St. Paul, Minneapolis & Omaha
Denver & Rio Grande Western
Duluth, Missabe & Iron Range
Duluth, Winnipeg & Pacific
Elgin, Joliet & Eastern
Erie
New Jersey & New York
Georgia & Florida
Grand Trunk Western
Canadian National Lines in New England
Great Northern

Pere Marquette
Pittsburg, Shawmut & Northern
Pittsburg & Shawmut
St. Louis-San Francisco
St. Louis, San Francisco & Texas
Georgia Southern & Florida
Northern Alabama
Southern Pacific
Utah
Wabash
Ann Arbor
Western Pacific

This is not to say, of course, that all these roads are as yet in as serious a condition as the Rutland. Many, if not most, of them have assets which they are drawing upon, and which may save some of them, if the lean period does not last too long. But their problem is the same as that of the Rutland, excepting that the Rutland has exhausted the assets which it has been using to meet deficits.

Every Railroad Is a "Rutland" to Some Degree

Many other railroads will soon be in the same desperate situation if their operating expenses are not soon reduced more or their traffic does not speedily revive.

Nor is this all. Practically every railroad which is still operating "in the black" has a "Rutland" somewhere in its system. That is to say, even the profitable railroads have branch lines (and even parts of main lines) which are not earning their expenses—with wages and taxes at present levels. And if wages and taxes are continued at present levels, not only is there danger that a great many entire railroads may have to close up shop, but all the other railroads are going to have to discard thousands of miles of unprofitable mileage.

The labor leaders do not seem to care because in June, 1938, the railroads had 801,000 less employees than in June, 1929, and about 263,000 less than in June, 1937. They are apparently concerned only about those remaining employed at the highest wages in history, and to hell with the unemployed. But as they oppose consolidations and unifications because of their tendency to reduce employment by reducing mileage and service, they must feel some concern about what is going to happen to many thousands of those still employed if inability to earn operating expenses and taxes causes a large additional mileage to be abandoned and torn up. Experience shows that the danger of a future large reduction of railroad mileage is very real.

The total railroad mileage of the country reached its maximum in 1916 when it was 254,251 miles. Statis-

tics of the Interstate Commerce Commission show that at the end of 1936 it had declined to 240,104 miles. Statistics compiled by the *Railway Age* indicate that in 1937 there was a further decline of 992 miles. It would appear, therefore, that the country's total mileage at the end of 1937 was about 239,112 miles, or 15,139 less than in 1916. This was smaller than in 1910; and the poor earnings being made this year probably will cause a decline exceeding the previous record declines of almost 2,000 miles annually in 1933 and 1934.

When employment declines on mileage that remains in existence there is always a chance that it will be restored. Obviously there is no chance of its restoration on mileage that goes out of existence. What kind of victory will it be for the labor unions, if they succeed in enforcing their "purchasing power" theory, but lose the jobs of most of their members? Already the railroads are employing only 54 per cent as many persons as nine years ago. The loss of their jobs by 46 per cent of railway employees since 1929 is certainly a famous victory for those they have paid to protect their jobs. It indicates how sound and beneficial have been the policies of the railway labor leaders and the "labor-loving" politicians.

The Rutland situation is so "typical" of conditions that it foretells the kind of catastrophe which will afflict every section of the country, and a part at least of the lines of every railroad system in the country, if present conditions are allowed to drift. The nature of the Rutland's problem is simply set forth in an order addressed by Federal Judge Harland B. Howe to Receiver L. G. Morphy and which reads in part as follows:

"Referring to the railroad, a common expression is: 'What will the court decide?' This shows much misunderstanding. The court cannot reduce salaries or wages—the railroad is too 'poverty stricken' to engage in a strike or a quarrel of any kind or wait for the Labor Board to decide what the wages shall be or wait many days for the decision of its officers and employees to reduce their salaries and wages—the decision must be theirs instead of the court's.

" * * * Whether an official shall be paid \$15,000 a year, or say \$6,000, or let the position vanish, is for him to decide instead of the court; whether an engineer-man shall be paid \$20 for nine hours work instead of say \$10, or let the employment vanish, is for him to decide instead of the court (that's an extreme illustration) and so with all the others, except such groups as track-men. * * *

"Whether taxes at the rate of \$1,000 a day shall be paid or say \$500 a day, or let the taxes vanish is for the officers of Vermont and New York to decide instead of the court—perhaps they will decide to impose all or a part of the difference in taxes on the busses and trucks that have taken the railroad's traffic. Whether the bonds should be reduced from \$9,000,000 to say \$3,000,000 and the interest reduced from 4½ to say 3 per cent is for the bond owners to decide instead of the court. All will decide that the \$9,000,000 in preferred and common stock has no value.

"All the court and the receiver can do is to say what the income is and what the expenses are, then execute the decision of the different groups. The responsibility in deciding to operate or to stop operating the railroad is theirs instead of the court's. The court will not allow the receiver to operate the railroad many days at a loss of \$2,400 a day."

The present railroad wage question, it appears quite

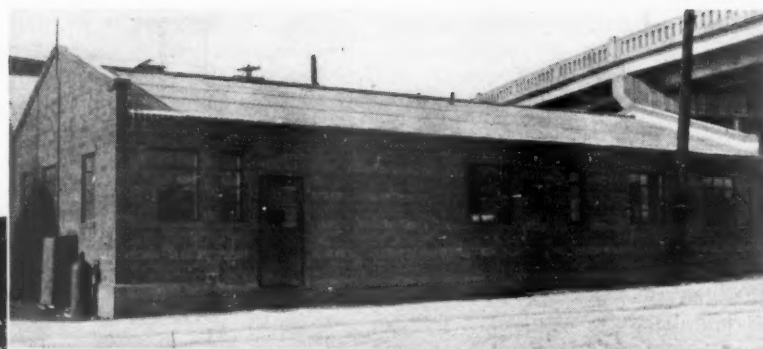
clearly from this "typical" railroad, does not hinge at all upon the unrealistic political theory advanced by Mr. Whitney and the other labor leaders as to how much railroad employees and the country might prosper if existing employee "purchasing power" were maintained. Instead, from the point of view of the majority of railroad employees, it simmers down to this: "*How much better off would I be at 25 per cent or even 50 per cent less wages than I am now getting, rather than have no job at all?*" That is the choice that the Rutland employees must make. Left to themselves, it is safe to say that the decision, at least of the higher-paid employees, would be to accept whatever reduction might be necessary in order to keep their jobs. Because any engineman or trainman in a rural region well knows that, even with a 50 per cent wage reduction, he would still earn more money, and at easier work, than would be available for him if he were forced to drive a truck, or accept some other employment that the countryside affords.

Union Leaders Risk Their Members' Jobs

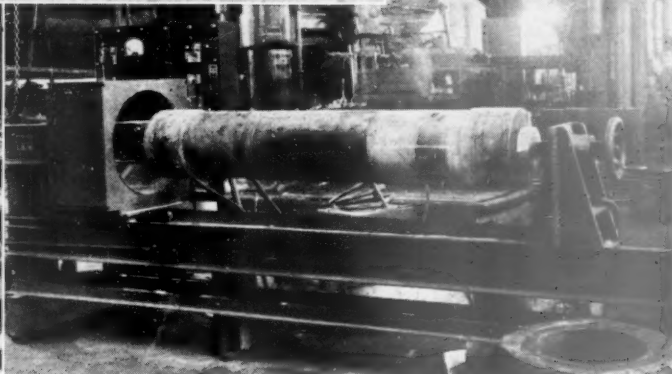
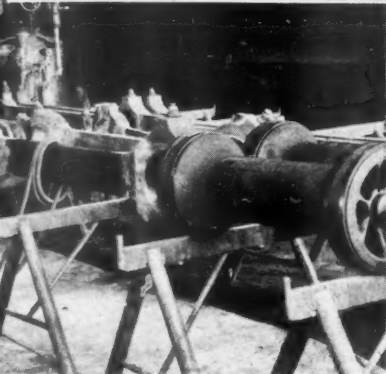
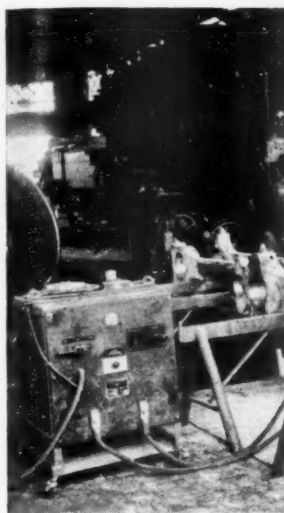
The national unions seem to be doing their best to bewilder their Rutland members and to induce them to risk or sacrifice their jobs rather than do what would show that *doing away with artificial working rules and paying "going rates" of wages would put almost any bankrupt railroad back on its feet.* But in the long run, it is inconceivable that they will succeed. If the road actually ceases operation, shippers will undoubtedly be able to restore at least a part of it to operation—because they need the service and because there are thousands of men available who would gladly do the work now done by railroad employees at a fraction of the "standard" wages the railroads are paying.

If the people of the United States desire to be deprived of railroad service, as many of them already have been, all they need to do is to support the labor unions and the taxing authorities in their efforts to force the railroads to continue paying out more than they take in. Very soon other and larger railroads will then be up against the same situation that the Rutland faces today. The public will lose its railroad service, the employees will lose their jobs—and still, we suppose, the labor executives and the New Deal politicians will be telling the people that wages high to the point of ruin add to "mass purchasing power" and hence induce national prosperity. The outcome very likely may be that a lot of Class I railroad mileage which is not totally abandoned will revert to a locally-owned short line status; and the employees will then draw locally prevalent wages and work eight hours or more a day for their pay. If so, they will have the present leaders of the railway unions and their self-styled friends among the politicians to thank for the loss of every vestige of their present privileged status.

Right—The New Laboratory. Below—One of the Portable Magnaflux Units Testing Locomotive Rods



Below—The Fixed Magnaflux, Non-Destructive Testing Unit Located at the Denver Shops of the Road



D. & R. G. W. Builds New Testing Laboratory

With well planned facilities, this road is now prepared to check materials purchased and also to do effective research work

DURING the last year, the Denver & Rio Grande Western has built and equipped a testing laboratory at Denver, Colo., in conjunction with its locomotive shop facilities at that point, that is unique for a railway of its size. Manned by a force of skilled technicians and investigators, a number of important investigations have already been completed at the laboratory, and others, affecting the activities of nearly all of the departments of the road, are under way.

The new laboratory building is designed for making general laboratory tests and for carrying out practical research, both to insure adherence to specifications in the wide range of materials and supplies purchased by the road, and, where possible, to assist in the development of higher standards in the design and manufacture of these materials and supplies. To this end also, the equipment and furnishings provided within the laboratory were so chosen and located as to insure their most practical and beneficial use without the waste of space or of the time of the laboratory forces.

Building Strictly Utilitarian

The building, a one-story structure without a basement, 62 ft. long by 32 ft. wide, is of fireproof construction throughout, with tile brick exterior walls, steel roof trusses covered with Transite, and a concrete floor. The ceiling within the building is 10 ft. high and plas-

tered throughout, and all of the interior wall faces are finished with smooth tile brick. Important considerations in the design of the building were the manner of distributing compressed air, steam, gas and water throughout its various rooms and laboratory area, employing copper piping, and the 220- and 240-volt electric current provided, which is so arranged as to be available not alone for the usual methods of electrical testing and research, but also for Magnaflux magnetic and other non-destructive methods of testing materials.

The more important rooms or areas within the laboratory include an analytical room, 22 ft. long by 20 ft. wide; a physical-testing room, 30 ft. long by 30 ft. wide; and a metallurgical department, which occupies an area approximately 20 ft. long by 10 ft. wide. All of these areas are furnished with Kewanee & Peterson furniture, the tables all being of oak with acid-proof tops.

The analytical room, which is essentially a chemical laboratory, has one long table which is used primarily for oil testing and for electrolytic analysis. Included in the oil testing equipment are a two-tube Saybolt viscosimeter with thermostatic control, a Pensky-Martins closed-cup flash tester, a Taglibue closed-cup tester for light oils, a navy-type film strength machine, a penetrometer of the latest design, and Burrell electrolytic equipment. Other items of equipment in this room include an International centrifuge, a water still which provides distilled water for all testing work, fading and

weather-testing equipment for paints and similar materials, and an electric ice box. In addition to the long table provided for oil testing and electrolytic analysis, other tables provided in this room include one in the center which is fitted with equipment for general analytical work, and a third table which is equipped and used essentially for water inspections and testing and for similar classes of work.

Adjacent to and auxiliary to the large analytical room which contains two tables on which are mounted electric furnaces, coal furnaces, a carbon train, an automatic Ainsworth-type TC balance and several routine balances. This room also contains microscopic and polarizing equipment for making photoelastic investigations of materials.

The physical testing room, where all of the physical tests of materials and equipment are made, also includes a complete machine shop for the preparation of specimens and for the building of equipment necessary in connection with the testing work carried out. This room is equipped with a 200,000-lb. capacity Tinius-Olsen testing machine, with automatic and autographic attachments and auxiliary equipment for making tests of tension, compression, shear, bending and Brinell hardness; a Rockwell hardness-testing machine; and a Riehle impact tester of 220/110 ft.-lb. capacity with accessories for Izod and Charpy impact and tensile-impact tests. The physical testing room also contains coal-grinding apparatus; rotapps; a three-wheel, variable-speed, metallographic-polishing machine and table; a bakelite press; and a specimen-cutting machine.

The metallurgical department is equipped with the latest model Leitz micrometallograph with optical accessories providing magnification up to 2,000 diameters, cameras for microscopic photography, and a dark room equipped with modern accessories and Kewanee dark-room laboratory furniture. One of the primary functions of this department has been the standardizing of metal-

lurgical testing operations, although it is directly responsible for the inspection and testing of all new ferrous and non-ferrous materials and co-operates with the various using departments, especially with regard to forging and heat-treating practices. This department is also concerned with research in an endeavor to develop and study new materials which might be adopted for rail use.

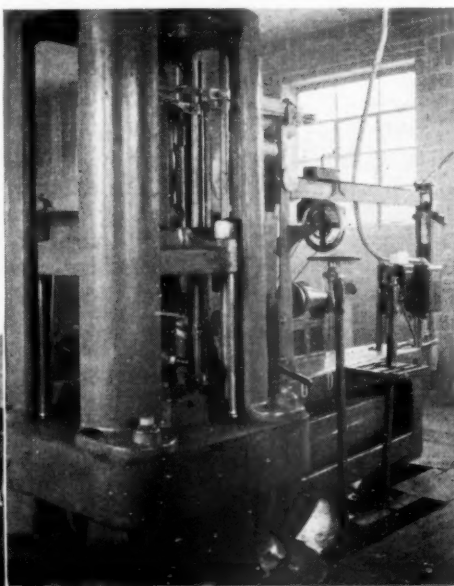
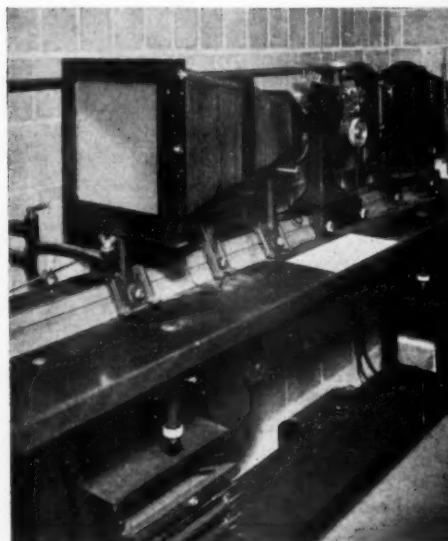
The organization employed in conjunction with the new laboratory is under the direction of Ray McBrien, engineer of tests, and includes a chief chemist, a metallurgist, a supervisor of water treatment, a research technician, a chief metals inspector, and three electrical engineers. The chief chemist is in charge of all chemical investigations made, which, in fact, are first in volume in the work handled at the laboratory. In this work, he is assisted to a large extent by the research technician. The metallurgist is in charge of all metallurgical studies, and assists in the design and construction of equipment necessary for carrying out this class of work. The primary work of the supervisor of water treatment is to arrange for and to see that such tests are made as are necessary to the end that locomotive water treatment on the road is carried out in the most satisfactory manner.

The chief materials inspector is concerned primarily with the inspection of the materials purchased by the road, while the three electrical engineers included in the force, none of whom is located directly at the laboratory, are in charge of the Magnaflux magnetic testing which is being carried out. One of the electrical engineers is stationed at the road's shops at Denver, while the other two are located at Grand Junction, Colo., and at Salt Lake City, Utah, respectively.

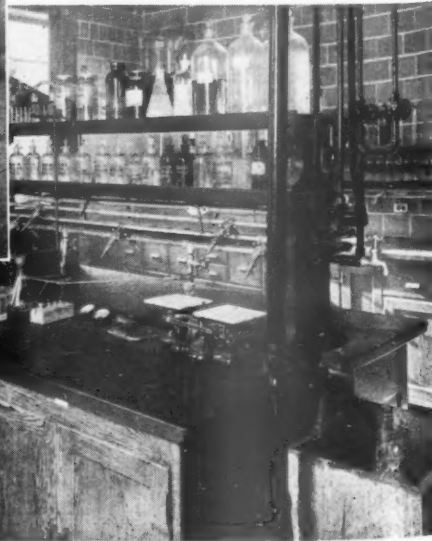
Magnaflux, Non-Destructive Testing

Of many tests being conducted at the laboratory, and through the laboratory staff in the field, one of the most

Right—The 2,000-Lb. Capacity Testing Machine at the Laboratory. Below—Some of the Metallograph Equipment in the Metallurgical Department



A Wide Variety of Analyses and Tests Are Made in the Well-Equipped Analytical Room, a Section of Which Is Shown Below



important and unique types is the Magnaflux magnetic, non-destructive test, which is being carried out with both portable and fixed testing units, for locating defects in castings and other metal parts. A valuable feature of this method of testings is the discovery of small surface fatigue cracks in the initial state of development, which, observed in time, can be eliminated, and the parts saved. Another important feature is, of course, the discovery of well-developed cracks and defects in parts, resulting in their being scrapped and thus eliminating possible service failures.

The Magnaflux testing unit is a device to lower the voltage and raise the current, making it possible by means of a few turns of No. 0000 cable to secure any desired number of ampere turns. From 500 to 2,000 ampere turns are generally found to be sufficient for the testing work. In the set-up, the cable is wrapped directly around the part to be tested and a magnetic powder is sprinkled over the piece. The defects found under this arrangement will be at right angles to the magnetic flux or, as in the case of testing a locomotive side rod, transverse cracks will be found. In order to locate longitudinal defects, a heavy current, usually about 1,500 amperes, is passed directly through the piece instantaneously, in which case the magnetization resulting is circular.

This latter method is especially adapted and advantageous for the routine testing of axles or small tools, where the anticipated defects are in the direction of the current flow. The magnetic powder can be applied either wet or dry, as convenient, as either method is effective. On the D. & R. G. W., dry powder is used, sprinkled lightly over the surface with a shaker, as it is best suited for covering large areas such as engine hinge castings, main rods, locomotive axles, pistons, pedestals, etc.

Throughout, the road has found the Magnaflux method of testing highly reliable. In fact, it is said that the re-examination of parts by this method has disclosed defects which have not been brought to light by the Whiting method. In carrying out the Magnaflux testing, the operators report all defects found to the proper operating officer, sending copies of such reports to the laboratory whenever it becomes necessary to scrap material. In this latter event also, failed parts are sent to the laboratory for further investigation.

Since the inauguration of the Magnaflux method of testing and the opening of the laboratory on the road less than a year ago, more than 6,000 locomotive parts have been tested and, among these more than 2,500 parts have been found defective. The nature of the tests being carried out on the railroad include back-shop testing, testing in the roundhouse, at the drop-pit, in the wheelhouse, etc., and the use of a gasoline-driven portable Magnaflux unit for testing track fixtures. Also, new castings are tested upon arrival at the various stores or shops. In the roundhouse and at the drop-pit, the Magnaflux method of test is used on a quarterly inspection of such materials as rods, valve motion parts, crank pins, etc. In the back-shops, practically all dismantled material from locomotives is tested, including such parts as rods, arms, axles, bolts, castings, cranks, collars, cross-heads, drawbars, fulcrums, hangers, levers, links, pedestals, pins, rockers, races, valve stems, straps, yokes, wheel centers, and other miscellaneous parts. At the wheel-house, axles and wheels are tested.

In addition to detecting defects in many classes of new parts that are not detected by ordinary methods of inspection, and thus avoiding possible service failures, the Magnaflux method of testing has resulted in the rejection and replacement of many parts which did not meet specifications. Furthermore, as used in many instances, it has brought to light the true cause of service

failures and has resulted in the improved design and manufacture of parts. In this latter respect, particularly as regards locomotive ferrous castings which have failed in service, the application of the non-destructive test to those areas of potential failure in new castings has frequently disclosed indications of defects in design and manufacture. Brought to the attention of the manufacturer, these facts have frequently resulted in the elimination of these defects through redesign or improved manufacturing methods. Through these various ways, therefore, the use of the Magnaflux method of testing has resulted in large savings to the D. & R. G. W. In fact, it is said that the savings being effected through this method of testing alone more than off-set the laboratory overhead expenses.

Many Field Tests and Investigations

In addition to this method of testing, many other types of investigation, testing and analysis are carried out by the laboratory force. For example, more than 1,500 analyses have already been made of such products and materials as cement, water, coal, waste, glass, lime, cleaning materials, Babbitt, brass, paper, wood, water, ice, etc. In addition, investigations have been made of metal culvert coatings; of steel plates, sheets, etc., to detect laminations and other defects; of lubricating oils and paints; of tie plates, track tools, and track fastenings; and of such other products as fusees, torpedoes, and hose.

Most of these investigations are made at the laboratory, but a considerable number of them are supplemented by tests made in the field. One of the most interesting of the field investigations now under way has to do with the corrosion of rail and track fastenings in the Moffat tunnel, 6.2 miles long. It is said that the preliminary investigations already made in this connection indicate the possibility of developing means of doubling the life of the rail and fastenings in this tunnel.

Another field test being carried out is the Magnaflux test of 112-lb. rail joint bars, a considerable number of which have failed in service. These tests, coupled with photoelastic tests in the laboratory, have already developed a number of interesting facts which will be of value in considering the modification of the design of these bars to overcome their present weakness.

Along with these last two mentioned tests having to do with the corrosion of rail and rail fastenings in tunnels and with 112-lb. joint bars, the road, under the immediate direction of its research technician, is now giving special attention to the removal of front end cinders from ballast; the fireproofing of bridge timber; rail end-hardening; odor control in air-conditioned cars; the detection of cracks and defects in axles while mounted on wheels; the failure of culverts in service; the waterproofing of concrete and the development of concrete which is resistant to the action of alkali and corrosive waters; the measurement of scale in locomotive boilers and fireboxes by magnetic means; the possibilities of smokeless coal; the elimination of fog from car windows; and the aging of firebox and boiler steel. As in the case of so many of the investigations which have already been carried out with the new laboratory facilities and supplemented research organization, it is expected that many of these special investigations, and others which will be undertaken from time to time, will bring about highly beneficial results, with large ultimate economies and other advantages to the road.

We are indebted to A. E. Perlman, engineer maintenance of way of the D. & R. G. W., under whose direction these facilities have been provided, for the information contained in this article.

The Friction of Brake Shoes at High Speed and High Pressure*

Tests at University of Illinois Experiment Station indicate the practicable limits of the rate of work performance for both shoe and wheel protection

THE tests described in this bulletin were undertaken at the University of Illinois Engineering Experiment Station because of the recent revival of interest in brake-shoe friction. A general increase in the speed of all trains, climaxed by the development of the high-speed streamline trains, has shown the necessity of supplementing existing test data in order to be able to predict their stopping distance. The chief purpose of the tests was to determine the values of the coefficient of friction of railway brake shoes under conditions similar to those which prevail on the road in stopping trains traveling at high speed by means of high pressures on the shoe of the car wheel.

During the investigation 432 stops were made. The tests were run at shoe pressures from 4,500 to 20,000 lb. Under each of these pressures stops were made from initial speeds of 60, 80 and 100 miles an hour. The results are in accord with those of previous experiments in which the maximum shoe pressure was about 15,000 lb. and the maximum speed about 65 miles an hour. Beyond these limits there is a definite change in the trend of the results. This variation is caused by the drastic change in the behavior of the shoe material which occurs when shoe pressures above 15,000 lb. are combined with speeds above 60 m. p. h.

During the tests 21 brake shoes were used. They were all unflanged Diamond S reinforced-steel-back shoes and were made by the American Brake Shoe and Foundry Company. With five exceptions, all of the shoes had chilled ends. All tests were made upon a multiple-wear rolled-steel wheel 33 in. in diameter for use on 6-in. by 11-in. axles. It was made during July, 1930, and was chosen by a representative of the university from the wheel stock of a western railroad. The tread is of the double-taper contour which was maintained during all the tests. Its weight, ready for test, was 773 lb.

All tests were so-called stop tests in which the test conditions simulate those which prevail in service when the brakes of a train are applied to bring it to a stop. The brake-shoe pressure remains constant throughout the stop, but the tangential pull and the coefficient of friction vary somewhat during the period of the stop. The coefficient of friction value reported for the stop is its average value during this period. Five stops under the same pressure and initial speed constitute a test and, in general, the average value of the coefficient of friction for the five stops is reported.

The data recorded during each stop provide means for determining, in addition to the average coefficient of friction, the coefficient of friction, the elapsed time and

the distance run for various intervals from the beginning to the end of the stop. During some of the tests the temperature of the brake shoe and of the wheel tread were measured by means of inserted thermocouples. In all tests all calculations in determining the result of the coefficient of friction are based on the kinetic energy existing in the revolving unit at the time the brake shoe is applied.

Coefficient of Friction

For each of the three initial speeds the coefficient-of-friction values are plotted in Fig. 1, for all the various shoe pressures.

As in previous experiments, the coefficient of friction decreases as the initial speed is increased. At speeds of 60 and 80 miles an hour, there are no exceptions to this decrease with speed throughout the entire pressure range. At the speed of 100 miles an hour, however, there is a recovery of the coefficient at shoe pressures above 14,000 lb., such that at 15,000 and 16,000 lb. the coefficient at

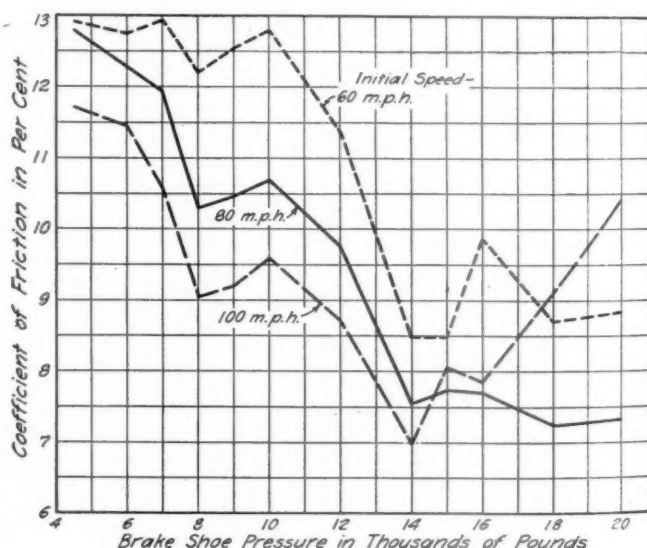


Fig. 1—Relation Between Coefficient of Friction and Brake-Shoe Pressure, for All Tests

100 miles an hour is greater than at 80 miles an hour. At shoe pressures of 18,000 and 20,000 lb., the coefficient at 100 miles an hour is not only greater than at 80 miles an hour, but it is also greater than the coefficient at 60 miles an hour.

Previous experiments have shown a general decrease in coefficient of friction as the shoe pressures are increased. In general, these tests show a similar decrease

* This article is a condensed abstract of Bulletin No. 301 of the University of Illinois Experiment Station entitled "The Friction of Railway Brake Shoes at High Speed and High Pressure," by Herman J. Schrader, assistant professor of mechanical engineering. Price, 60 cents. The article is largely confined to a statement of the results of the tests and conclusions drawn therefrom, with little attention to the details of methods or to the wealth of test data on which the statement of results is based.

except at the higher pressures used. The actual variations of coefficient with pressure are shown in Fig. 1. With one exception (at 7,000 lb. and 60 miles an hour), the coefficient decreases at all three speeds until the shoe pressure reaches 8,000 lb. From this point, however, it rises again until the shoe pressure becomes 10,000 lb. This temporary rise in the coefficient may, perhaps, be

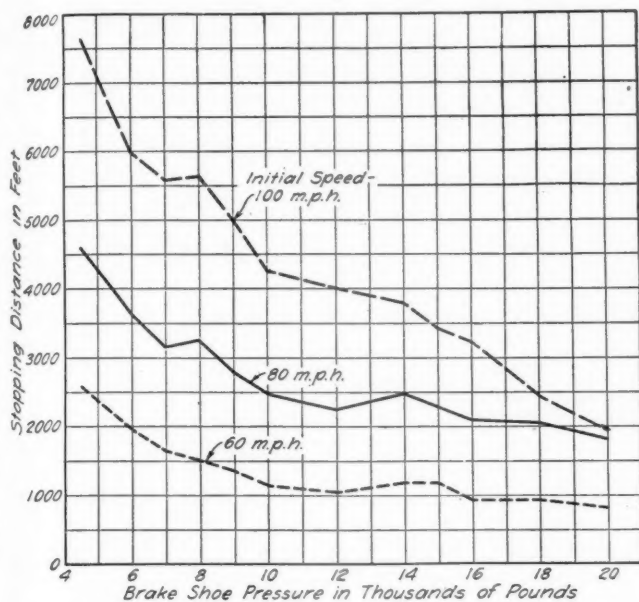


Fig. 2—Relation Between Stopping Distance and Brake-Shoe Pressure, for All Tests

due to the better seating of the shoe on the wheel under pressures of 7,000 and 10,000 lb., or to inherent frictional qualities of the shoes Nos. 8 and 9. Beginning at a pressure of 10,000 lb., there is, under all three speeds, a definite and rapid decrease in the coefficient of friction until the shoe pressure reaches 14,000 lb. From this point, at speeds of 60 and 80 miles an hour, with one exception (16,000 lb. and 60 miles an hour), the coefficient remains practically constant. At 100 miles an hour, however, the coefficient increases rapidly for pressures above 14,000 lb. (which gives a coefficient of friction of only 6.95 per cent), becoming 8.04, 7.84, 9.10 and 10.41 per cent at pressures of 15,000 lb., 16,000 lb., 18,000 lb., and 20,000 lb., respectively.

The reason for this recovery in coefficient of friction at shoe pressures in excess of 14,000 lb. probably lies in the fact that under these higher combinations of speed and pressure the rate of heat generation is so high that the shoe material begins to soften at the surface of contact. Such a surface softening of the shoe would result in more intimate contact between shoe and wheel, and in more rapid tearing away of the shoe material; and both of these changes would account for the increase in the coefficient of friction. This view is well supported by the recorded rise in shoe temperature under these severe conditions, by the fact that a continuous stream of particles of molten metal issues from beneath the shoe during most of its period of application, and by the very marked increase in the shoe wear which occurs at these combinations of high speed and high pressure.

Stopping Distance

Stopping distance, since it combines the effects of both coefficient of friction and shoe pressure, provides a means for more direct comparisons of the effectiveness

of various combinations of speed and pressure than is provided by the coefficient alone. The average values of stopping distance are plotted for all pressures and each of the three speeds in Fig. 2. At each of the three test speeds the stopping distance decreases fairly regularly as the shoe pressure is increased. At both 60 and 80 miles an hour the rate of decrease diminishes, however, at the higher pressures, so that at neither of these speeds was very much gained by increasing the pressure above 12,000 lb. At speeds of 60 miles an hour the increase in pressure from 12,000 lb. to 20,000 lb. produced a decrease in stopping distance of only 224 ft. At speeds of 80 miles an hour the corresponding change in pressure produced a decrease in distance of 437 ft. During the tests from an initial speed of 100 miles an hour, however, an important decrease in distance was attained by increasing the pressure from 12,000 to 20,000 lb. At the former pressure the average stopping distance was 4,006 ft., whereas at the higher pressure the distance was only 1,930 ft.—a decrease of 2,076 ft. Unfortunately, however, at both 80 and 100 miles an hour, pressures much in excess of 12,000 lb. produce an excessive shoe wear; and apparently at these two speeds an increase in shoe pressure above about 14,000 lb. will prove, on this account, to be impracticable. The tests at high speed and high pressure also caused serious damage to the wheel tread.

Brake-Shoe Wear

The weight lost per hundred million foot-pounds of work performed is the unit usually employed to define shoe wear. Fig. 3 shows the wear in terms of this unit, plotted with respect to shoe pressure for each of the three test speeds.

During the tests at 60 miles an hour the shoe wear was of moderate and tolerable amount throughout the entire

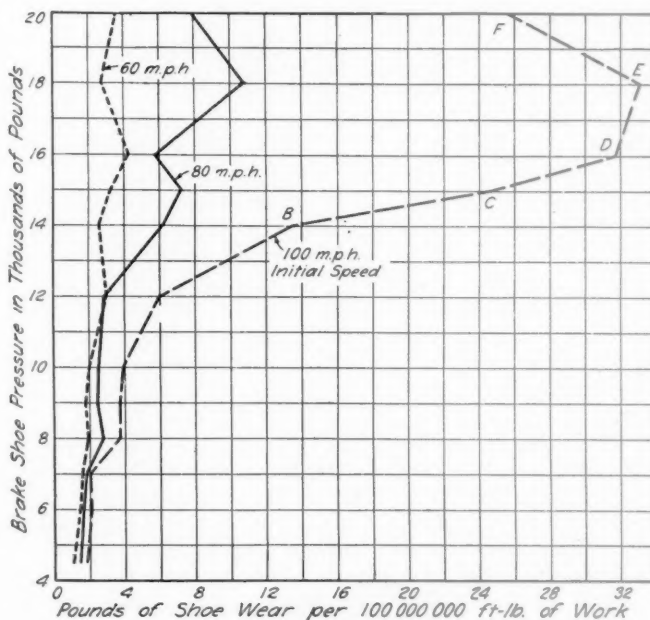


Fig. 3—Relation Between Brake-Shoe Pressure and Brake-Shoe Wear, for All Tests

pressure range, although there was a fourfold increase in the wear between pressures of 4,500 lb. and 20,000 lb.

Considering the results for speeds of 80 miles an hour, it is apparent that for pressures from 4,500 lb. to 12,000 lb. the shoe wear is very moderate. With pressures higher than 12,000 lb. the wear increases, until at 18,000

lb. the wear is ten times that at 4,500 lb. Although this increase in the wear is of a considerable magnitude, it is not intolerable, and it is likely that the higher pressures can be used to advantage in train service where the maximum speed is about 80 miles an hour.

During tests at 100 miles an hour a radical change in the rate of shoe wear begins at point *A*, corresponding to a pressure of 12,000 lb. At points *A*, *B*, *C*, *D*, *E* and *F* the average wear per stop is, respectively, 0.25 lb., 0.56 lb., 0.99 lb., 1.26 lb., 1.30 lb., and 1.02 lb. Obviously, at point *A* some fundamental change in the behavior of the shoe material begins. The test records show that at pressures beyond this point a marked rise in shoe temperature occurs, and that there is a softening of the shoe material as evidenced by the continuous ejection of molten particles from the shoe surface. Furthermore, the shoes are not only rapidly worn away under these severe test conditions, but even a new shoe after one or two applications may be so badly cracked as to render it unfit for further service. Evidently the point *A* marks the beginning of conditions which cause a breakdown in the shoe material, which at pressures beyond that prevailing at this point become so serious as probably to render the use of higher pressures impracticable. The shoes of pattern C-40 and C-51, when new weigh respectively 20 and 25 lb., and when worn to the thickness at which they would usually be discarded they weigh about 11 lb.; there is available, therefore, about 9 lb. and 14 lb. of wearable metal, respectively, on the two shoes. Consequently, at the rate of wear prevailing during stops from 100 miles per hour and at pressures above 14,000 lb., the thin shoe would have to be rejected from service after from six to nine stops, and the thick shoe after from ten to fourteen stops. Disregarding any damage done to the wheel by the combinations of high speed and high pressure, the shoe wear alone may render these high pressures impracticable.

Evidently there are, at high speeds, limits to the pressures which may practically be used in train brakes if this general breakdown in shoe material is to be avoided. These limits are imposed by the overheating of the shoe, and they cannot, therefore, be defined by setting a limit to the number of foot-pounds of work to be performed by the shoe without regard to the time within which the work has to be performed. The limits must be defined in terms of the time-rate of work performance, instead of in terms of its mere magnitude. The relations between the foot-pounds of work performed and dissipated per second and the pounds of shoe wear per 100 million ft.-lb. of work done are plotted in Fig. 4, for all combinations of pressure and speed. On this graph the points lettered *A*, *B*, *C*, *D*, *E*, and *F* correspond to the same combinations of speed and pressure as the points so lettered on Fig. 3.

Since the difficulties arising from the change in behavior of the shoe begin to be acute under the conditions prevailing at points *B* and *C*, the limiting rates of work performance ought not be greater than the rates which prevailed at those points, namely 78,000 and 98,500 ft.-lb. per second. The suggestion is offered that the limiting rate of work performance ought to be set at about 90,000 ft.-lb. per second. This limit is shown on Fig. 4 by the heavy horizontal line. If this suggestion is accepted then the test results are to be interpreted as meaning that, if excessive wear and deterioration of brake shoes are to be avoided, no brake shoe of the types tested should be subjected to braking conditions which will require it to perform and dissipate more than 90,000 ft.-lb. of work per second.

The combination of high speed and high pressure causes a softening of the shoe surface, as evidenced by

the continuous ejection of molten metal particles. The molten metal was not only scattered over the laboratory but a large amount of it was welded to the surface of the wheel. If this material is not removed from the tread, the building up of the spots is cumulative since during the next stop the shoe, bearing only on these spots, will deposit an additional layer of metal. In train service, this building up of shoe material on the wheel tread may be a cause of hard riding cars. In some cases this welded material is hard enough to make indentations in the rails.

In general the shoe material was not welded to the wheel surface until the pressure exceeded 16,000 lb. in the 60 miles-an-hour stops, and 12,000 and 10,000 lb. respectively, in the 80 and 100 miles-an-hour stops.

Since this difficulty occurred at combinations of speeds and pressures which required the shoe to perform and dissipate work at a rate of 70,000 ft.-lb. (or more) per second, it might be desirable, in some classes of service, to limit the rate of work performance to about 70,000 ft.-lb. per second. This limit is shown in Fig. 4 by the heavy broken line.

All the cracks which developed in the wheels during the investigation occurred during the cooling of the wheel, and most of them occurred after the temperature had dropped to about room temperature. The formation of the crack was accompanied by a loud ringing sound similar to the sound caused by a sharp blow with a light hammer on the rim of the wheel. The cracks, as they first appeared on the tread, were about full length and only a few became longer on additional tests. None of the cracks extended into the throat or flange, or to the outside of the wheel rim.

In determining the maximum rate of work which can be performed on a wheel without causing cracks on the tread, it is necessary to investigate a number of stops

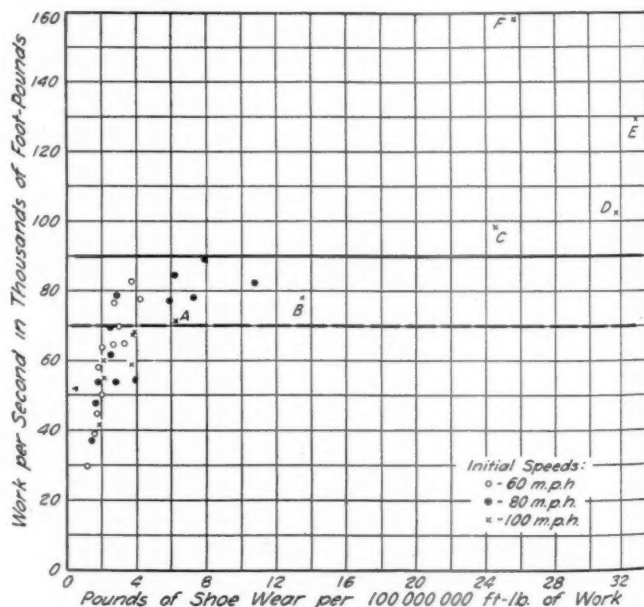


Fig. 4—Relation Between Work per Second and Brake-Shoe Wear per 100 Million Foot-Pounds of Work, for All Tests

preceding the test during which the crack was formed. For example, the first crack appeared after Test No. 3459, in which the average rate of work, for the five stops, was only 68,411 ft.-lb. per second; however, during the two preceding tests the work-rate was about 125,000 ft.-lb. per second. Cracks Nos. 2 and 7 to 12, inclusive, were also formed during tests in which the

work-rate was relatively low, but immediately preceding the tests in which these cracks were formed the wheel had been subjected to stops in which the work-rate was very high. A study of the data indicates that cracks may or may not be formed by stops made at such combinations of speed and pressure as require the shoe to do work on the wheel at a rate of 125,000 ft.-lb. per second, but when this work-rate is exceeded cracks will almost certainly be formed.

The characteristic failure of all the shoes is cracked and broken ends. In a few cases this did not occur until the shoe was worn to about the allowable minimum thickness; very many shoes were rejected, however, on account of the ends failing, long before they reached this minimum thickness. Combinations of speed and pressure which gave low shoe wear did not crack or break the ends until the shoe was near the allowable minimum thickness. In all tests where the work-rate was over 90,000 ft.-lb. per second this failure occurred, and in some cases the ends gave way after only two or three stops.

Relative Merits of Shoes

Four types of shoes were used in the tests. The tests to determine their relative merits were all made with pressures of 18,000 lb. and 20,000 lb., and speeds of 60, 80, and 100 miles an hour. In these tests two new shoes of each type were used. They are grouped as follows:

- (a) Shoes Nos. 50 and 51 of pattern C-40, with chilled ends.
- (b) Shoes Nos. 70 and 71 of pattern C-40, with plain ends.
- (c) Shoes Nos. 100 and 101 of pattern C-51, with chilled ends.
- (d) Shoes Nos. 120 and 121 of pattern C-51, with plain ends.

All were "Diamond S" reinforced steel-back shoes. The shoes of pattern number C-40 were 1½ in. thick and weighed 20 lb. each when new, while those of pattern number C-51 were 2 in. thick and weighed 25 lb.

Considering the light and the heavy shoes, it is found that the coefficient of friction and the shoe wear is lower for the heavy shoes than for the light shoes; and that the stopping distance is greater for the heavy shoes than for the light ones. The main advantage of the heavy shoes is that in them an increase of 55 per cent of wearable metal is attained by an increase of only 25 per cent in weight. Except under conditions where the minimum stopping distance is of paramount importance, this fact may be regarded as offsetting the small deficiency in coefficient of friction of the heavier shoes.

Considering the plain and the chilled-end shoes, the co-efficient of friction, the stopping distance and the shoe wear are practically the same for these two types of shoes. The tendency for the ends of the shoes to crack and break was more pronounced on the chilled than on the plain shoes.

All four types of shoes wore away unevenly under the tests at high speeds and high pressures, and on some shoes the difference in thickness at the end was as much as ½ in. after the tests. In this respect the chilled-end shoes were slightly superior.

Conclusions

The following conclusions seem warranted by the test results. They are applicable only to the types of shoes and the kind of wheel tested.

- (1) If excessive wear and deterioration of brake shoes are to be avoided, no cast-iron brake shoe should be

subjected to braking conditions which will require it to perform and dissipate more than 90,000 ft.-lb. of work per second.

- (2) The building up of the welded brake shoe material on the wheel tread may be avoided by limiting the braking conditions to combinations of pressure and speed such that the work-rate performance of the shoe is kept below 70,000 ft.-lb. per second.

- (3) Shoe pressures of 20,000 lb. combined with high speeds, cracked the wheel tread at a very rapid rate, and the rate of performing work on the wheel should be kept below 125,000 ft.-lb. per second in order to avoid this type of failure.

- (4) Under the conditions of shoe pressure and speed prevailing in these tests the heavy shoes of pattern C-51 are more economical than those of the lighter pattern C-40; and are preferable, unless the service conditions are such as to make minimum stopping distance of paramount importance.

- (5) The chilled-end shoes were not superior to the plain-end shoes when tested at high speeds and high pressures.

[There are four appendices to the report in which the data bearing on variation of the coefficient of friction during the stopping period, variation of coefficient of friction with shoe thickness, relation between shoe bearing area and coefficient of friction, and the temperatures of wheel and shoe are presented and discussed. With respect to the first of these subjects the report concludes that, with shoe pressures below 16,000 lb., there is definite increase in the coefficient of friction beginning at a point where the speed has decreased to about 35 miles an hour and continuing to the end of the stop. At pressures above 16,000 lb. the coefficient is fairly uniform during the entire stopping period with the exception that during stops from an initial speed of 100 miles an hour the coefficient is high at the beginning and again high when the speed has decreased to about 60 miles an hour. With respect to the temperature of wheel and shoe, the conclusion is that some accurate method of measuring the surface temperature of a revolving wheel must be developed before any reliable conclusions can be drawn as to the relation of the surface temperature of the car wheel and car-wheel failures. The temperature at a point ⅛ in. below the surface is no indication of the surface temperature. A minimum of about 10 thermocouples would probably be required to give a reliable average temperature of the surface of the shoe.—Editor.]

Bus Travel Booklet

THE Greyhound Lines have just issued an unusual travel booklet. It is called "This Amazing America," and contains 140 short sketches, illustrated by drawings of strange and unusual places in this country that can be reached by Greyhound bus service. Under the caption "Seeing Is Believing," Greyhound explains the purpose of this attractive booklet, as follows:

"In every corner of America, strange sights—almost unbelievable yet very real—repay the travels of those who are looking for the unusual. Some of these curiosities are natural, some are man-made, some are weird, some laughable, all are amazing. Until you've seen your share of these unconventional spectacles, you haven't seen your great country. To aid you in getting the most pleasure out of your travels—to point out the location of many little-known oddities—Greyhound here tells briefly the story of some of America's most 'unreal' realities."



Fig. 1

By **T. F. Perkinson,**
General Electric Company, Erie, Pa.

IT was natural that the early Diesel-electric locomotives assumed the outward appearance of the straight electric locomotives, since it was the electric locomotive manufacturer who pioneered in the development of the Diesel-electric locomotive. Typical of the early models is the 600-hp., 100-ton locomotive shown in Fig. 1. The box-shaped cab housed two engine-generator sets placed side by side in a central "engine room" with the associated auxiliary apparatus—compressors, control equipment, etc. An operator's cab separated from the engine room was located at each end of the superstructure. Excellent visibility was afforded an operator at the end in which he was located when looking forward or along one side of the locomotive, but otherwise visibility was poor. Little attention to the general exterior appearance of the locomotive was given, as evidenced by the variety of equipment—radiators, radiator fans, air tanks, mufflers, bells, headlights, etc.—mounted on the cab roof.

After the first half-dozen years of commercial applications, the idea of placing the engine, or engines if more than one were employed, under a hood separated from the operator's cab was employed—a departure that imitated automotive practice to a striking degree. The inclusion of the engine in a relatively narrow housing provided greater visibility for the operator and gave him a view of the switchman's steps directly ahead or behind, without the necessity of the operator leaning out of the side window. Fig. 2 illustrates the application of such design to a single-engine, 300-hp., 57-ton locomotive, while Fig. 3 indicates the same type of treatment in the construction of a two-engine locomotive. Utility rather than appearance was predominant in these designs, although unquestionably the appearance of the locomotive was incidentally improved by the removal of radiators from the roof and their location within the lines of the engine housing.

Fig. 4 illustrates a design that retains the general appearance of the conventional steam locomotive—the cab is located at one end of the superstructure and the engineer's position is in very much the same position as on the steam locomotive. Excellent visibility ahead of the locomotive when running with the cab forward is afforded, and fair visibility along one side of the engine housing is obtained with this arrangement. Note, however, that the general appearance has been considerably improved.

In Fig. 5 (a 100-ton, 600 hp., locomotive) the use of an engine with relatively low overall height has permitted the construction of a low engine housing and has provided greater all-round visibility for the operator. A more pleasing appearance in the engine housing has been obtained by the rounding-off of corners, and roof-mount-



Fig. 2



Fig. 3

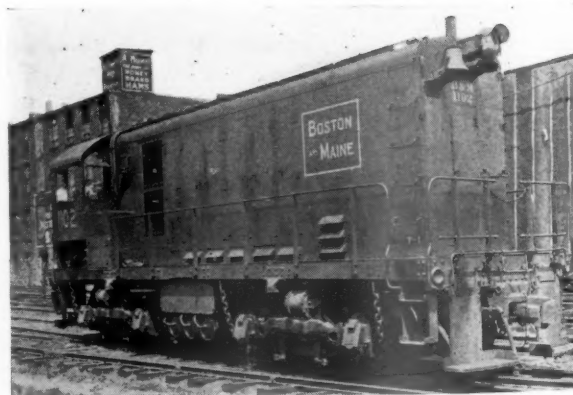


Fig. 4



Fig. 5

"Ugly Duckling"

ng becomes a Swan

Appearance evolution of the Diesel-electric switcher

ing of radiators has been completely eliminated. The "cab-at-end" construction, however, does not provide the symmetry of appearance to be found in later designs, particularly in those utilizing two engines.

In Fig. 6 the use of two relatively small engines has permitted the construction of low engine housings. The operator's position has been raised and centrally located so that a commanding view of both end-steps is afforded. A greater proportion of the cab side-walls are windows and the visibility is vastly improved. The engine mufflers have disappeared and the headlight, heretofore standing out like the proverbial "sore thumb," has actually begun to "sink" out of sight into the radiator housing. Even the bell has been tucked away beneath a step so that its outline no longer interferes with the "sky-line" of the locomotive superstructure. Exhaust pipes have been pulled back in against the cab fronts so



Fig. 8



Fig. 7



Fig. 6



Fig. 9

that, while still visible, they do not interfere too much with the smooth appearance of the cab structure.

Little has been done to improve the appearance of the underside of the platform with the exception that tanks and compressors are located symmetrically and in a workmanlike manner.

Larger engines naturally mean higher engines and thus the engine housings shown on the 1000-hp., locomotive in Fig. 7, are somewhat higher than those of Fig. 6. The same general cleanness of outline is evident in Fig. 7, however, and the headlight has been further subdued by setting it into the radiator housing. The exhaust pipes are more prominent than those of Fig. 6.

In Fig. 8 the single-engine 450-hp., locomotive has the appearance of an oversized automobile—a coupe model—as far as the superstructure is concerned. Visibility is excellent in all directions, and the exterior lines have been well smoothed out.

In all of the foregoing illustrations painting as a decorative motif, or trim for the sake of appearance only, is singularly lacking. And this is not strange. The Diesel-electric switching locomotive, as a rule, is not in the public eye, and as mentioned before its performance is not surrounded with an aura of swiftness—of the glamour associated with rapid and luxurious travel. Despite these deficiencies of atmosphere, the 1000-hp., 130-ton locomotive illustrated in Fig. 9 should dispel any thought that the Diesel-electric switching locomotive is not susceptible to genuine artistic as well as utilitarian design.

All of the desirable features of visibility from the operator's cab, accessibility to equipment both above and below the platform, and pleasing appearance have been incorporated in this design.

The two-tone color-scheme—vermillion engine-hood

tops with a jet-black finish on the remainder of the locomotive—is nicely supplemented by the chrome trim in the hand-rails, window frames, engine housing trim, deck belt and in the owner's name and number.

The skirting beneath the platform conceals, without making inaccessible, the battery boxes, compressor and air tank equipment. Flush doors in the skirt on one side give ready access to the battery for servicing and maintenance purposes.

The grille-work, concealing the radiator, with its inset chrome trimmed headlight, gives an appearance strikingly similar to the modern automobile.

The Diesel-electric switcher has, indeed, come a long way in appearance evolution since its introduction to industry and the railroads.

Mediation Invoked in Wage Dispute

SERVICES of the National Mediation Board were invoked on August 3, when the Carriers' Joint Conference Committee and the Brotherhood of Railroad Trainmen, the members of which have been negotiating the carriers' demand for a 15 per cent wage cut at Chicago since July 18, concluded that further negotiations would be futile. The entrance of a mediator, the next step provided for under the Railway Labor Act, was anticipated for several days. On July 29, H. A. Enochs, chairman of the Carriers' Joint Conference Committee, stated that this committee had prepared documents invoking the services of the Mediation Board and that these would probably be dispatched by August 3. At that time the Railway Labor Executives Association stated that it would conclude its case on August 4. At the time of going to press, representatives of this Association were taking a vote to determine whether they would join the carriers in requesting the services of a mediator. The Carriers' Committee at the same time stated it would invoke the services of a mediator regardless of the outcome of the vote. Both groups of employees, at that time, still refused to accept any reduction in pay. At the meeting with the trainmen, who had not set a date for the conclusion of their case, the Carriers' Committee asked the trainmen to join in the request. It is expected that mediation at Chicago will begin August 8.

In commenting upon the action taken Mr. Enochs said:

"We have shown the trainmen that railroad wage scales today, in a time of general business depression, are at the highest average level in history, while the railroad industry is facing disaster. We have shown them that railroad employees, for every hour on duty are now receiving wages 20 per cent higher than in 1932, although the condition of their industry is far more desperate today than it was then. We have shown them that the average weekly earnings of railroad men today will actually buy 27 per cent more in the way of goods and services than did their earnings in 1929, the peak year of our national income.

"In marked contrast to the situation of the employees, we have shown the representatives of the trainmen that one-third of the rail mileage of the nation is now in bankruptcy. We have shown the heavy traffic losses which the carriers have suffered. We have shown that, in the first quarter this year, more than half the country's rail mileage did not earn sufficient money to pay operating expenses and taxes, and that almost 90 per cent

of the mileage failed to earn enough to pay fixed charges—interest on money borrowed from the public, and rentals for leased roads. We have shown that the net result of railroad operation, in that period, was a loss of more than \$106,000,000.

"Further, we have shown that this situation has meant the loss of more than a quarter of a million railroad jobs within the last year. We have shown that the forced reduction in railroad purchases has meant the loss of thousands of other jobs in the basic industries of the country, which normally sell a large part of their output to the carriers. We have shown that all these factors prevent any return to a sound national prosperity. But despite the ample opportunity afforded and our urgent requests, the representatives of the trainmen persistently have refused to face the facts.

"Instead of any discussion of a wage reduction upon its merits, we have been read to at great length. But none of this material, which has been read to us, answers the present fundamental question: where is the money coming from to continue the payment of these peak wage scales? The railroads don't have the money and they have no means of getting it.

"The continued refusal of the trainmen's representatives to view the situation as it actually exists has finally forced us to the conclusion that continuance of negotiations upon the present basis is futile. In consequence, we have asked them to join with us in taking the next procedural step specified by the Railway Labor Act: that is to invoke the services of the Board."

Under the Railway Labor Act, the parties, or either party, to a dispute may invoke the services of the Board of Mediation or the Board of Mediation may proffer its services. In the past, one mediator has usually been assigned to the controversy, but because of the magnitude of the present case, it is thought that possibly several will participate. The mediator, under the act, will use his best efforts, by mediation, to bring the parties to agreement. If mediation is unsuccessful, the board will at once endeavor, as its final required action, to induce the parties to submit their controversy to arbitration. If both parties do not agree to arbitration, the Board of Mediation is required to notify the President of the United States, who may thereupon, in his discretion, create a board to investigate and report respecting such dispute. This board will investigate the facts and make a report to the President within 30 days from the date of its creation.

Negotiations in the present case have been conducted with two groups of employees because the trainmen withdrew from the Railway Labor Executives Association in June of last year and elected to negotiate with the railroads independently. It is not known as yet whether mediation will be conducted with each group or whether the trainmen will join the other employees in mediation.

Throughout the negotiations, each side has maintained its original position, the carriers demanding a 15 per cent reduction and the employees refusing to accept any reduction. The Carriers' Joint Conference Committee has stressed "ability to pay."

The employees contend that "ability to pay" is not a factor in determining wages but as yet have not suggested from what source the railroads can secure the money to maintain present wages.

THE SOUTH AFRICAN RAILWAY ADMINISTRATION has received the first of a group of 136 new locomotives recently ordered. Designed by the chief mechanical engineer of the administration, the locomotives are of the 4-8-2 type and are the largest non-articulated locomotives placed in service on the 3-ft. 6-in. gauge of the railways of South Africa.

Communications and Books . . .

Why So Many Train and Engine Men Are Laid Off

TO THE EDITOR:

RUSSELL, KY.

We have quite a time convincing the average citizen that engine and train crews are working 38 to 40 days each month. I am enclosing herewith a memorandum showing mileage which 19 crews at this point averaged the first half of July. July 2, 3, and 4 were observed as holidays by the miners and still these enginemen averaged nearly 18½ days in 12 working days. You will note that 5 extra enginemen averaged over 20 days and 4 firemen over 23 days. Enginemen earn \$9.72 per 100 miles and firemen \$7.35 on our Mallet type engines.

Are you surprised that 60 per cent of the engine and train service employees are furloughed?

I. L. MORELAND,
Furloughed Fireman, 21 Years' Seniority.

[Our correspondent enclosed an official memorandum which stated that the 19 engine crews working in the "pool" at Russell averaged 1838.7 miles in the first half of July (or slightly more than 18½ "days" of wages in 15 calendar days). The memorandum also revealed that 5 enginemen on the "extra board" at that point did even better, averaging 2093 miles each (or almost 22 "days" of wages) and that 4 extra firemen averaged 2343.28 miles (or almost 23½ "days" of wages) in the first half of July.—EDITOR.]

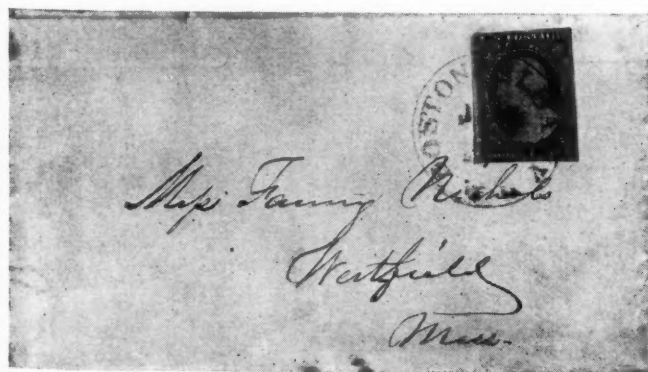
First Postal Car in United States

TO THE EDITOR:

NEW YORK.

A postal car carrying United States mail was in regular service between Boston, Mass., and East Albany, N. Y., in 1852, and doubtless some time before that. I send you a cover which was mailed in West Brookfield, Mass., in that year and carried to Westfield, about forty-eight miles, in such a car. The Hannibal & St. Joseph postal car pictured in your issue of July 9, 1938, page 35, was no doubt the first full eight-wheel car for this service, the earlier car in Massachusetts having carried passengers (second class) in one end. I well remember this style of car, which I saw daily in the years 1860-65; together with the spectacled school-master type of Yankee who sorted the letters.

The Boston & Albany mail route was over the Boston & Worcester, forty-four miles, and the Western, from Worcester to



East Albany, 156 miles. The Boston & Albany Railroad was not organized until 1867, after the construction of the first bridge at Albany.

Numerous writers have given credit for the first letter-distributing car to Colonel G. B. Armstrong and others, and have

given the date as about 1864; but Thomas L. James, former Postmaster General, writing in "The American Railway" (Scribners, 1899) gives the credit to W. A. Davis, clerk in the Post Office at St. Joseph, Mo., rather than Armstrong. Mr. James says, however, that the idea came from Canada and that the Canadians got it from England.

This is not the most important page in American history, but it is well to get the dates right. There is or was in the Chicago & North Western Station at Chicago a tablet giving credit to Armstrong as a pioneer.

The letter mailed at West Brookfield in 1852 does not show the year; but that is settled by other evidence; Miss Nichols, the addressee was married in 1853 and became Fanny Adams. The man who wrote the letter became her husband.

B. B. ADAMS.

New Books

Proceedings Association of American Railroads, Division V, Mechanical. Published by the Association of American Railroads, 59 East Van Buren street, Chicago. Price, to members, \$5; to other than members, \$10.

The proceedings of the session of the Association of American Railroads, Operations and Maintenance Department, Division V-Mechanical, held at the Municipal Auditorium, Atlantic City, N. J., June 16-23, 1937, contain also recommendations, letter ballots and other transactions for the year 1937. A list of the representatives at the meeting, the first full convention and exhibit since 1930, is also included.

The Future of British Railways, by W. J. Stevens. 101 Pages. 7½ in. by 5 in. Bound in cloth. Published by P. S. King & Son Ltd., London, Eng. Price 5 shillings.

This book is likely to jolt anyone even remotely connected with the railway industry out of any smugness, complacency or wistful optimism which he may possess. Although the author's conclusions are based upon the current British railway position, they unfortunately apply with even greater force to our own sick carriers.

The author isolates the stockholder as the real "forgotten man" of the railway set-up. Certainly, the carriers are up-to-date; of course, they have met the problems of competition and technological obsolescence with courage, says he. "But what of the thousands of investors?" he asks, declaring that the boards of directors have subordinated the owners' interests to every other claim upon them. He hopes that their reward will soon come and in the meantime "confidently recommends a little more patience" . . . since "their case is so good and their claims so just."

The book is really more an inventory of those forces which are at work today affecting the carriers, rather than a prophetic outpouring. And it's not a pretty picture he paints. The government, he claims, has not lived up to its optimistic half-promises given during the consolidation year of 1921; the so-called "standard revenue" has been but a phrase; "the process of equalizing the conditions between road and rail competition has been dilatory from the viewpoints of the highest interests of the trading and traveling public,—not to mention the taxpayer and ratepayer"; "surgical operations" on capital investment—or "putting 'em through the wringer," as American politicians have so quaintly phrased it—are being proposed on every hand.

Of labor, Mr. Stevens says that they will serve themselves best by promoting the prosperity of the carriers, since "wages, after all, are based upon the net product of the industry." He suggests, also, that, under their powerful unions, employees join with management and investors in promoting their joint interests. Think of the political influence likely to be wielded, says he, should nearly 600,000 employees and a much larger body of stockholders stick their heads together.

NEWS

Auto Rental Plan For New Haven

Road announces co-ordinated
train and "drive-ur-self"
auto travel plan

A co-ordinated "Rail-Auto Travel Plan," whereby passengers will ride trains to cover longer distances and drive automobiles to cover territories around nine key cities on the New York, New Haven & Hartford was announced this week by F. J. Wall, vice-president in charge of traffic. Under the plan, special reduced mileage rates on Hertz "drive-ur-self" automobiles will be afforded to every New Haven passenger arriving at his destination city within 48 hours of purchasing ticket. The service has been particularly planned to appeal to companies having traveling men on the road, making calls in the district surrounding the larger cities. For business houses,



The New Haven's Rail-Auto Plan
in a Nut-shell

special arrangements have been made to eliminate cash transactions and to facilitate reservations, identification, and use of the automobile.

At the time of purchasing ticket, patrons of the plan will obtain a standard receipt for railroad fare, which will be evidence of transportation over the railroad. Cost of reservation telegram up to 35 cents will be credited to the rental charge. Passengers will be transported without charge between railroad station and Hertz garage,

with the exception of New York City, where the Hertz operator is located on the west side of Grand Central terminal.

Hertz operators in Boston, Mass., Providence, R. I., Worcester, Mass., Hartford, Conn., Springfield, Mass., New Haven, Conn., Bridgeport, South Norwalk, and New York, all located on the New Haven road, are co-operating in the scheme.

Letters have been mailed to various industrial and commercial executives advising them of the service, and stating that the railroad is making the new rail-auto plan available in nine key cities for the

6 Months N. O. I. Was \$70,289,305

Return of 0.67 per cent on
investment is reported by
Class I roads

Class I railroads of the United States in the first half of 1938 had a net railway operating income of \$70,289,305, which was at the annual rate of return of 0.67 per cent on their property investment, ac-

CLASS I RAILROADS—UNITED STATES

	Month of June		
	1938	1937	1930
Total operating revenues	\$282,139,794	\$351,651,222	\$439,377,179
Total operating expenses	218,192,353	265,521,794	330,732,585
Taxes	28,360,594	16,103,881	30,580,933
Net railway operating income	25,000,803	59,354,317	67,683,471
Operating ratio—per cent	77.33	75.51	75.27
Rate of return on property investment—per cent	1.18	2.80	3.27

	Six Months Ended June 30		
	1938	1937	1930
Total operating revenues	\$1,636,408,495	\$2,086,873,083	\$2,658,254,307
Total operating expenses	1,331,962,329	1,558,569,773	2,048,678,522
Taxes	169,662,302	163,997,274	177,366,289
Net railway operating income	70,289,305	299,466,304	369,416,251
Operating ratio—per cent	81.40	74.68	77.07
Rate of return on property investment—per cent	0.67	2.84	3.46

present,—"with the hope and belief that its value to business firms will shortly warrant extending it more widely." A small folder enclosed presents the main features of the plan and it is announced that a special booklet containing further details is now in preparation. The folder points out that all auto mileage can be billed at the end of the month, thus eliminating all cash transactions in connection with the Hertz automobiles.

Advertisements which the road has placed in leading newspapers throughout its territory refer to the plan as combining "all the values of modern rail travel in air-conditioned comfort . . . all the convenience of your own auto at destination."

New Hearings Set in Express Rate Case

The Interstate Commerce Commission, Division 7, has revised its schedule of hearings in Ex Parte 126, the express rate increase case. The new schedule is as follows: Birmingham, Ala., August 23, Commissioner Caskie presiding; Chicago, Ill., August 26, Commissioner Aitchison presiding; Cheyenne, Wyoming, August 29, Commissioner Aitchison; New York City, September 7, Commissioner Caskie; and San Francisco, Calif., September 16, Commissioner Porter.

cording to the Bureau of Railway Economics of the Association of American Railroads. In the first half of 1937, their net railway operating income was \$299,466,304 or 2.84 per cent on their property investment, and in the first half of 1930, their net railway operating income was \$369,416,251 or 3.46 per cent on property investment.

Gross operating revenues for the first six months of 1938 totaled \$1,636,408,495 compared with \$2,086,873,083 for the same period in 1937, and \$2,658,254,307 for the same period in 1930, a decrease of 21.6 per cent below 1937, and 38.4 per cent below 1930. Operating expenses for the first six months of 1938 amounted to \$1,331,962,329 compared with \$1,558,569,773 for the same period in 1937 and \$2,048,678,522 for the same period in 1930. Operating expenses for the first six months of 1938 were 14.5 per cent less than in the same period of 1937, and 35 per cent below 1930.

Class I railroads in the first six months of 1938 accrued \$169,662,302 in taxes compared with \$163,997,274 in the same period in 1937, and \$177,366,289 in the same period in 1930. For the month of June alone, tax accruals of the Class I railroads amounted to \$28,360,594, an increase of \$12,256,713 or 76.1 per cent above June, 1937. Sixty-one Class I railroads failed

(Continued on page 229)

Deadline for Pay Plan Set by Court

Judge directs Rutland receiver to deduct 10 to 30 per cent from wages by August 4

Federal Judge H. B. Howe has directed L. G. Morphy, receiver of the harassed Rutland, to inform all employees of the road that they cannot remain as employees after Thursday, August 4, unless they consent to a deduction from wages of from 10 to 30 per cent, according to weekly bases, such deduction not to constitute a prior lien on the property against liens and obligations having priority in time, and to be made up only in the event of increased earnings by the carrier. In directing the wage deduction, Judge Howe stipulated the following sliding scale of deductions:

Weekly Earnings	Percentages to be Deducted
\$15 to \$23	10 per cent
Over \$23 to \$29	15 per cent
Over \$29 to \$35	17½ per cent
Over \$35 to \$58	20 per cent
Over \$58 to \$69	25 per cent
Over \$69	30 per cent

He then declared categorically: "Any employee who is not willing to help his employer by accepting these terms should give up his employment and stop working next Friday."

In legal explanation of the requirement that the wage deductions be held not a prior lien, the judge declared that the court would not allow the receiver to run into debt for necessary supplies and equipment "when there are no prospects that they can ever be paid for if you pay the full amount of the wages in cash when they become due," adding parenthetically, "You could not get trusted for such things if you wanted to." Secondly, the judge declared, the court will not, in effect, "allow the mortgaged property to be confiscated as against the liens and mortgages on it that are first in time, by increasing the amount of the liens on it for wages that are prior in law."

Significant portions of the direction received by Mr. Morphy are here quoted: "You are directed to say to each person employed by you as receiver (by giving each a copy of this) as follows: That you cannot pay all cash for their services, nor even 85 per cent, after midnight, next Thursday, August 4, for you haven't and cannot get the money; that the court will not allow their liens for wages that are prior in law to all others, to accumulate on the mortgaged cars, engines, rolling stock or any other property after that time; that if any person continues in your employ by performing the duties of his employment after that time, it will be on the condition that he waives and relinquishes his lien for wages on any property as against the liens and encumbrances on it that are prior in time, and gives you credit as receiver without any security or right to payment before the payment of taxes, supplies, repairs, rent of cars, depreciations and all other expenses to keep the road and equipment in safe operating condition for their safety, as well as for

the safe use of the public, for the following percentages of his pay. [Here follows the sliding scale printed above.—Ed.]

"This is the only way you can possibly operate. Any employee who is not willing to help his employer by accepting these terms should give up his employment and stop working next Friday."

"There is a great difference between an employer who can pay wages in cash and an employer who cannot do that because he has not and cannot get the money. If employees insist on taking in wages more than the business can pay, then operations must stop. It is for each employee to decide next Thursday whether he will help continue the business of his employer or whether he will help destroy it."

The court notification concluded with a note of praise for the Rutland officers and a plea for employee co-operation. "To you, Mr. Receiver, and your companion officers, who have generously combined positions and reduced salaries 56 per cent (Continued on page 230)

May Has Deficit Of \$25,502,501

Compares with a net income of \$1,321,939 for fifth 1937 month

Class I railroads reported a deficit, after fixed charges and other deductions, of \$25,502,501 in May, 1938, as compared with a May, 1937, net income of \$1,321,939, according to the Interstate Commerce Commission's monthly compilation of selected income and balance sheet items. For the first five months of 1938 the Class I carriers reported a deficit of \$165,299,371 as compared with a net income of \$20,536,369 for the same period of last year.

Ninety-five roads reported deficits for May, 1938, and 38 reported net incomes; in May, 1937, 72 reported deficits and 61 reported net incomes. The consolidated statement showing the net income of roads

SELECTED INCOME AND BALANCE-SHEET ITEMS OF CLASS I STEAM RAILWAYS

Compiled from 136 Reports (Form IBS) Representing 141 Steam Railways
(Switching and Terminal Companies not Included)

TOTALS FOR THE UNITED STATES (ALL REGIONS)

For the month of May		Income Items	For the five months of	
			1938	1937
\$16,496,694	\$44,239,448	1. Net railway operating income	\$45,288,499	\$240,111,982
11,566,504	11,428,973	2. Other income	55,561,959	55,985,491
28,063,198	55,668,421	3. Total income	100,850,458	296,097,473
1,807,112	1,619,746	4. Miscellaneous deductions from income	10,262,182	8,859,135
26,256,086	54,048,675	5. Income available for fixed charges..	90,588,276	287,238,338
10,755,326	11,757,603	6. Fixed charges:		
		6-01. Rent for leased roads and equipment	52,009,000	60,992,830
39,777,627	39,727,062	6-02. Interest deductions	†197,741,412	†199,423,174
213,061	234,332	6-03. Other deductions	1,071,668	1,159,565
50,746,014	51,718,997	6-04. Total fixed charges	250,822,080	261,575,569
*24,489,928	2,329,678	7. Income after fixed charges	*160,233,804	25,662,769
1,012,573	1,007,739	8. Contingent charges	5,065,567	5,126,400
*25,502,501	1,321,939	9. Net income	*165,299,371	20,536,369
16,922,068	16,280,564	10. Depreciation (Way and structures and Equipment)	84,058,851	81,196,194
1,035,682	2,699,498	11. Federal income taxes	4,868,456	14,051,606
11,189,045	17,437,379	12. Dividend appropriations:		
708,883	3,439,542	12-01. On common stock	29,575,125	42,366,155
		12-02. On preferred stock	5,255,786	8,355,354
			Balance at end of May	
			1938	1937
13. Investments in stocks, bonds, etc., other than those of affiliated companies (Total, Account 707)			\$650,637,120	\$700,221,084
14. Cash			\$307,238,043	\$466,946,351
15. Demand loans and deposits			7,608,346	10,329,263
16. Time drafts and deposits			19,569,102	41,144,370
17. Special deposits			64,091,885	311,975,917
18. Loans and bills receivable			4,358,139	10,627,346
19. Traffic and car-service balances receivable			50,275,787	62,533,010
20. Net balance receivable from agents and conductors			43,350,007	56,191,658
21. Miscellaneous accounts receivable			132,114,166	147,186,549
22. Materials and supplies			363,944,202	366,412,049
23. Interest and dividends receivable			24,252,929	28,999,142
24. Rents receivable			1,645,709	2,028,988
25. Other current assets			4,317,283	7,186,440
26. Total current assets (items 14 to 25)			\$1,022,765,598	\$1,511,561,083
		Selected Liability Items		
27. Funded debt maturing within 6 months†			\$199,791,992	\$140,016,753
28. Loans and bills payable§			\$239,874,504	\$222,804,812
29. Traffic and car-service balances payable			65,785,102	80,984,637
30. Audited accounts and wages payable			223,703,526	258,496,294
31. Miscellaneous accounts payable			68,367,758	130,070,858
32. Interest matured unpaid			712,668,259	576,963,144
33. Dividends matured unpaid			1,630,368	1,667,042
34. Funded debt matured unpaid			525,205,306	480,067,843
35. Unmatured dividends declared			12,298,017	19,777,272
36. Unmatured interest accrued			109,679,791	116,678,866
37. Unmatured rents accrued			38,105,188	40,600,228
38. Other current liabilities			32,715,352	26,432,309
39. Total current liabilities (items 28 to 38)			\$2,030,033,171	\$1,954,543,305
40. Tax liability (Account 771):				
40-01. U. S. Government taxes			\$59,185,653	\$134,977,161
40-02. Other than U. S. Government taxes			143,726,778	132,253,758

* Deficit or other reverse items.

† Represents accruals, including the amount in default.

‡ Includes payments which will become due on account of principal of long-term debt (other than that in Account 764, Funded debt matured unpaid) within six months after close of month of report.

§ Includes obligations which mature not more than 2 years after date of issue.

NET INCOME OF LARGE STEAM RAILWAYS WITH ANNUAL OPERATING REVENUES ABOVE \$25,000,000

(Switching and Terminal Companies not Included)

Name of railway	Net income after deprec.		Net income before deprec.	
	For the five months of 1938	1937	For the five months of 1938	1937
Alton R. R.	\$1,092,385	\$245,058	\$942,236	\$98,550
Atchison, Topeka & Santa Fe Ry. System ¹	5,944,455	400,927	988,496	5,082,970
Atlantic Coast Line R. R.	1,158,761	2,650,193	2,012,086	3,500,090
Baltimore & Ohio R. R.	10,906,544	109,291	7,855,349	3,119,623
Boston & Maine R. R.	2,420,406	564,928	1,746,568	1,234,779
Central of Georgia Ry. [†]	1,456,993	546,270	1,100,108	218,469
Central R. R. of New Jersey	1,572,837	595,534	982,267	4,367
Chesapeake & Ohio Ry.	4,431,708	13,066,693	7,893,041	16,497,208
Chicago & Eastern Illinois Ry. [‡]	995,212	209,833	734,396	41,881
Chicago & North Western Ry. [‡]	9,992,414	8,090,798	7,878,341	6,023,786
Chicago, Burlington & Quincy R. R.	2,618,243	147,105	517,532	1,856,622
Chicago Great Western R. R. [‡]	1,102,692	641,240	878,655	421,684
Chicago, Milwaukee, St. Paul & Pacific R. R. [‡]	9,924,968	7,249,142	7,543,160	4,988,918
Chicago, Rock Island & Pacific Ry. [‡]	7,064,520	6,556,799	5,331,539	4,864,821
Chicago, St. Paul, Minneapolis & Omaha Ry.	1,368,423	1,649,837	1,122,936	1,402,820
Delaware & Hudson R. R.	711,726	207,779	274,939	651,371
Delaware, Lackawanna & Western R. R.	1,817,117	578,471	785,893	1,630,707
Denver & Rio Grande Western R. R. [‡]	3,239,321	2,912,230	2,733,752	2,434,628
Elgin, Joliet & Eastern Ry.	495,007	819,353	77,001	1,188,931
Erie R. R. (including Chicago & Erie R. R.) [§]	6,163,268	1,210,608	4,594,868	2,799,105
Grand Trunk Western R. R.	2,749,371	270,726	2,278,090	695,243
Great Northern Ry.	7,030,116	2,287,636	5,478,813	778,661
Illinois Central R. R.	1,514,913	2,158,502	1,186,474	468,814
Lehigh Valley R. R.	1,968,457	112,466	1,058,747	834,363
Long Island R. R.	1,225,515	1,038,073	736,873	549,852
Louisville & Nashville R. R.	1,061,950	3,270,437	733,438	5,008,642
Minneapolis, St. Paul & Sault Ste. Marie Ry. [‡]	3,338,770	2,923,554	2,826,344	2,413,000
Missouri-Kansas-Texas Lines	2,326,829	710,307	1,777,740	217,095
Missouri Pacific R. R. [‡]	7,960,175	4,797,331	6,121,724	3,054,589
New York Central R. R. [‡]	15,115,074	7,669,431	8,419,598	14,339,405
New York, Chicago & St. Louis R. R.	1,620,518	1,140,099	905,162	1,814,672
New York, New Haven & Hartford R. R. [‡]	5,677,202	1,558,708	4,270,173	136,162
Norfolk & Western Ry.	3,731,225	13,195,551	5,807,336	15,156,955
Northern Pacific Ry.	6,057,366	3,041,673	4,645,970	1,699,808
Pennsylvania R. R.	5,640,139	12,010,443	4,805,468	22,302,563
Pere Marquette Ry.	1,785,946	965,818	785,735	2,031,497
Pittsburgh & Lake Erie R. R.	68,624	1,732,349	1,004,907	2,455,670
Reading Co.	108,037	3,464,105	1,414,228	4,755,904
St. Louis-San Francisco Ry. [‡]	6,187,771	3,638,232	4,885,905	2,328,395
St. Louis Southwestern Lines [‡]	847,435	456,871	588,135	205,416
Seaboard Air Line Ry. [‡]	2,636,567	926,642	1,786,898	131,495
Southern Ry.	3,162,751	1,930,201	1,885,619	3,238,710
Southern Pacific Transportation System [‡]	11,810,980	916,088	8,353,383	2,414,163
Texas & Pacific Ry.	42,377	1,023,582	539,915	1,510,069
Union Pacific R. R. (including leased lines)	643,271	350,597	3,697,207	3,142,205
Wabash Ry. [‡]	3,709,511	660,645	2,812,996	228,610
Yazoo & Mississippi Valley R. R.	268,234	195,752	43,368	399,534

* Deficit.

† Report of receiver or receivers.

‡ Report of trustee or trustees.

§ Under trusteeship, Erie R. R. only.

1 Includes Atchison, Topeka & Santa Fe Ry., Gulf, Colorado & Santa Fe Ry., and Panhandle & Santa Fe Ry.

2 Includes Boston & Albany, lessor to New York Central R. R.

3 Includes Southern Pacific Company, Texas & New Orleans R. R., and leased lines. The report contains the following information: "Income reported hereon excludes offsetting debits and credits for rent for leased roads and equipment and bond interest, between companies included herein. Interest on bonds of, and rental income from, separately operated solely controlled affiliated companies, whether earned or not, are included in this statement, in order that such income credits will offset income debits reflected in the net deficit of such companies. Operations of all separately operated solely controlled affiliated companies, resulted in a net deficit of \$3,231,848 for the five months ended May 31, 1938, and \$1,312,711 for the five months ended May 31, 1937, which is not reflected in this statement."

having annual operating revenues above \$25,000,000 is given in the accompanying tables.

Carriers Ask ICC Investigation of Arkansas Rates

Railroads operating in Arkansas have asked the Interstate Commerce Commission to order an investigation into certain commodity rates in that State following the refusal of the State Corporation Commission to allow increases in freight rates corresponding to those allowed by the commission in Ex Parte 123.

Sees Rosy Future in Passenger Business

Assertions that railroad passenger traffic can be greater than it ever has been and that competition has served to stimulate such business, were made by Edward G. Budd, president, Edward G. Budd Manufacturing Company, Philadelphia, Pa., in a recent nation-wide radio broadcast released by the National Association of Manufacturers. Interviewed by George E. Sokol-

sky author and commentator, Mr. Budd pointed to the railroads which have added new equipment as a basis for his prediction.

"Instead of being an enemy of the railroad business, the automobile is now recognized as a feeder of and stimulant to the railroads, and a builder of the travel appetite," said Mr. Budd. "Various of our great railroads have introduced passenger cars built of fine high-grade steels, stainless, and which weight one-half as much as the standard car before in use. These roads find that these trains mean faster schedules and make more profit for the roads. Cutting the cost of travel in half, multiplies the number of travelers many times. Reducing the time en route makes it possible for the traveler to spend a maximum of free time in business or pleasure with a minimum of time in transit."

L. & A. and K. C. S. Merger

Louisiana & Arkansas directors, representing nearly all of the 160,000 common shares, 58,000 shares of six per cent prior

preferred and 40,000 shares of six per cent preferred shares outstanding, are reported to have accepted the price offered by the Kansas City Southern for control of the road. Special meetings of the two boards may be called in the near future to arrange the plan of merger through the exchange of securities.

Rock Island Fixed Charges—Correction

An article appearing in the *Railway Age* for July 23, page 165, digesting the new plan of reorganization of the Chicago, Rock Island & Pacific, gave an erroneous impression that the annual interest charges of the road were \$69,185,942. Actually, this figure represented the total accrued interest from the time the road went into trusteeship. The annual interest charges of the Rock Island are \$14,052,769.

Welding of L- and T-Type Side Frames Prohibited

Upon instructions from the General Committee of the A. A. R. Mechanical Division, recommendations from the Arbitration Committee, concurred in by the Committee on Car Construction, to modify Interchange Rule 23 to prohibit welding of any description on L- and T-type side frames, also that Rules 3 and 19 should be modified to prohibit the application of L- and T-type side frames which have been welded to all interchange cars, were ordered submitted to letter ballot of the members.

The vote on these recommendations was divided into three propositions which, as a result of favorable letter ballot, are now approved, effective January 1, 1939, and will be incorporated in the next supplement to the current Code of Interchange Rules as advance information.

June Locomotive Shipments

June shipments of railroad locomotives totaled 21 as compared with a like number in May and 49 in June, 1937, according to reports from the country's principal manufacturing plants to the Bureau of the Census, United States Department of Commerce. Shipments for the first six months of 1938 totaled 172 as compared with 222 in 1937's first half.

The June figure included 12 steam locomotives, one electric and six Diesel-electrics for domestic service and two steam for export, as compared with May's 13 steam, three electric and 5 Diesel-electrics, all for domestic service. Unfilled orders at the end of June totaled 88 locomotives, including 26 steam, 20 electric and 35 Diesel-electrics for domestic service and seven steam for export.

The foregoing figures do not include locomotives built in railroad shops, or "self-propelled cars of any description."

Enthusiast Trips

The New York, New Haven & Hartford will operate a 350-mile railroad fan trip through central and eastern Connecticut and southern central Massachusetts on August 7, out of New York. The trip, which will be made in air-conditioned coaches, is routed from New York to

Westfield, Mass., via New Haven, Conn., thence over the Boston & Albany to Palmer, Mass. From here the train will run over the tracks of the Central Vermont to New London, Conn., where inspection of the docks and other facilities will be made. The trip back to New York will be made along the New Haven's shore line.

A "fan" trip is to be operated over the Bridgeton & Harrison, a 2-ft. gage railroad connecting with the Maine Central, on August 14, under the sponsorship of Railroad Enthusiasts, Inc., New England division. Flat cars will be attached to the regular narrow-gage coaches of the train for purposes of observation.

Helper Accident in Jamaica Kills 30

At least 30 persons were killed and more than 70 injured, many seriously, on the Jamaica Government Railway on July 30, when the engineer of a pusher locomotive, failing to note that the leading engine had stopped, because it was derailed, pushed the head-end locomotive and the first coach of a crowded passenger train over a steep embankment and made wreckage of the remaining coaches, according to official news dispatches. The five car train filled with week-enders, was traversing a mountainous section of the Kingston-Montego Bay line near Balaclava when the front engine was derailed on a curve. Receiving no warning of the sudden halt, the engineer of the helper locomotive coupled at the rear maintained his speed and forced the front engine and first coach over an embankment, piled up the second and third coaches and damaged the last two cars severely. Only eight persons were reported to have come out of the wreck unharmed.

Railway Clerks Protest N. Y. C. Action

A New York Central local of the Brotherhood of Railway Clerks has asked the Interstate Commerce Commission to prevent that road from taking individual action in discontinuing free pick-up and delivery service. The New York Central, Boston & Maine, and Delaware & Hudson, together with several smaller roads, have filed tariffs with the commission abolishing free pick-up and delivery service and making a small charge for the service. The union is of the opinion that eventually numerous employees will lose their jobs because of the New York Central's action.

The Florence Stove Company of Gardner, Mass., has also protested to the commission against the proposal insofar as it relates to the Boston & Maine, pointing out that "many of our competitors located off the Boston & Maine get free pick-up and delivery service and we ask for suspension of this rate on the grounds of undue prejudice."

No 1938 Meeting of A. A. R. Treasury Division

The Treasury Division of the Association of American Railroads will not hold a 1938 meeting, according to a decision reached at a July 22 Washington, D. C., meeting of the Treasury Advisory Committee. This action, according to a circular issued by E. H. Bunnell, A. A. R.

American Railroads in 214 Films

A list containing details of 214 motion picture films owned by or relating to railroads in the United States and Canada has recently been issued by the Association of American Railroads. The railroad companies themselves own 159 motion pictures which are available for the free use of clubs, schools, and other organizations. Many of these films are available in both 16 mm. and 35 mm. size, and about half of them carry a sound track. The majority are devoted to the country through which each railroad passes and are intended to stimulate interest in passenger travel. Nine of the films, however, cover railroad operations solely and afford laymen opportunity to penetrate such "mysteries" as yard operation and train control.

Commercial distributors own some 55 films dealing with railroad subjects, which are available for public showing. They range in subject matter from the history of railroading to old-fashioned silent dramas of the "Crossed Signals" thriller variety. Most of these films are 16 mm. size and come in both standard reel lengths and "shorts." The list also calls attention to two standard motion picture plays, "Wells Fargo" and "Union Pacific." The former is now being shown in theatres throughout the country, while the latter is being filmed under the direction of Cecil B. DeMille and is expected to be released in 1939.

vice-president in charge of the Finance, Accounting, Taxation and Valuation Department, was taken in view of the business recession and to conform to the general A. A. R. policy that under existing conditions meetings should be held only when there is an urgent necessity therefor.

Under the rules of order of the Treasury Division, members of standing committees, together with the chairman thereof, will continue in office until the next annual session. This will permit the present committees to submit their reports at an annual session, which reports will cover all matters considered during the interim since the 1937 meeting of the Division at New Orleans, La. This procedure will also include the present advisory committee, members of which will serve in that capacity until the next annual session.

R. E. A. Takes Over Southeastern Express Operation

The Railway Express Agency, in taking over express operations of the Southeastern Express Company on August 1, became the sole company possessing express contracts with rail carriers in the United States, added 9,642 miles of steam railroad lines to its mileage, as well as additional miscellaneous mileage on steamship and truck lines, and stretched its service list to include 850 new points

throughout the south. In taking over Southeastern operations, the Railway Express Agency assumed express contracts held by the latter company on the Southern, Mobile & Ohio, and 28 short line roads and steamship companies. At the same time, effective August 1, the Southeastern Express Company withdrew from the express business. The transfer was made without interruption in service and came as a result of an operating agreement made by the various railroads and express companies involved, which received the order of approval of the Interstate Commerce Commission on June 2, as was reported in the *Railway Age* for June 11, page 985. The consolidation of operations of the two companies is expected to make possible the inauguration of additional scheduled through cars between principal southern cities and those in other sections of the country. The move also eliminates delays formerly involved in transfers between the two companies.

Equipment Depreciation Orders

Equipment depreciation rates for six railroads, including the Denver & Rio Grande Western, have been prescribed by the Interstate Commerce Commission in a new series of sub-orders and modifications of previous sub-orders in No. 15,100, Depreciation Charges of Steam Railroad Companies. The composite percentages, which are not prescribed rates, range from 3.61 for the D. & R. G. W. to 4.14 for the Sumter & Choctaw.

The D. & R. G. W.'s prescribed rates on standard-gage equipment are as follows: Steam locomotives (new), 3.13 per cent; steam locomotives ("second cycle equipment"), 4.1 per cent; freight-train cars (new), 3.17 per cent; freight-train cars (second cycle), 3.86 per cent; passenger-train cars (new) 4.03 per cent; passenger-train cars (second cycle), 3.75 per cent; work equipment (new), 3.14 per cent; work equipment (second cycle), 3.67 per cent; miscellaneous equipment (new), 14.52 per cent; miscellaneous equipment (second cycle), 18.69 per cent. On narrow gage equipment the respective percentages for new and second cycle equipment are as follows: Steam locomotives, 3.1 per cent and 3.55 per cent; freight-train cars, 3.11 per cent and 3 per cent; passenger-train cars (second cycle), 3.27 per cent; work equipment, 3.16 per cent and 3 per cent.

Mechanical Conventions

The Committee on Co-ordination of Mechanical Conventions met at the Hotel Sherman, Chicago, Monday, July 25, F. P. Roesch presiding. The following associations were represented: Car Department Officers, International Railway General Foremen, International Railway Master Blacksmiths, Master Boiler Makers, Railway Fuel and Traveling Engineers, and Allied Railway Supply Association. In accordance with recommendations made by the General Committee of the Mechanical Division, A. A. R., it was decided that no conventions of these associations be held this year. In order, however, to avoid any break in the continuity of the proceedings and the committee reports and to maintain them up-to-date, it was decided

that open business meetings of the officers and committees of the various associations represented be held at the Hotel Sherman on Tuesday, September 27, and if necessary, the meetings be continued over Wednesday, the 28th. Some of the associations have so many reports to discuss that it will be difficult to dispose of them, even in the two-day period.

Announcement was also made at the meeting that the American Railway Tool Foremen's Association will unite with the International Railway General Foremen's Association. The suggestion was also made that efforts be made to revive the International Railway Master Blacksmiths' Association, affiliating it with the International Railway General Foremen's Association.

Accident on the New York Central

About 7:30 p. m., on July 31, the New York Central's eastbound Commodore Vanderbilt (fast Chicago-New York train) ran into the rear of the eastbound Mercury (streamlined Detroit-Cleveland train) at Rocky Ridge, Ohio, 20 miles east of Toledo. In the vicinity of the accident, this is a four-track line, with automatic block signaling supplemented with an automatic train-stop system.

The two trains were running about 8 min. apart when the Mercury grazed an automobile at a road crossing about 1,400 ft. west of Rocky Ridge station. The train was stopped and was then backed up, under flag protection, a short distance within the automatic block, to permit the crew to investigate the near accident at the road crossing.

In the meantime, the Commodore Vanderbilt was approaching, the engineman receiving a yellow "medium-speed" signal approximately 6,050 ft. west of the Mercury. When passing the yellow signal, the engineman evidently acknowledged and forestalled an automatic application of the brakes by operating a forestaller. He failed to apply the brakes so as to stop his train at the next signal in advance, which was in the stop position displaying red, and overran that signal, colliding with

the rear end of the Mercury at a speed of about 4 m.p.h.

About 15 passengers on the two trains were injured, only 3 being injured seriously. The rear observation end of the Mercury was damaged and the rear wheels of this car derailed. Damage to the locomotive of the Commodore Vanderbilt was slight, and no wheels of this train were derailed.

I. C. C. Prescribes Safety Glass For All Buses and Trucks

Division 5 of the Interstate Commerce Commission, on July 29, issued a new order which requires that all buses and trucks used in interstate commerce by common and contract carriers shall be equipped with laminated or "safety" glass in all windshields, doors, and windows. The case, which is a part of Ex Parte MC-4 dealing with the subject of qualifications of employees and safety of operation and equipment of common and contract carriers by motor vehicle, was reopened at the request of the Chrysler Corporation which manufactures buses and trucks. This company was joined by General Motors, Ford, Packard and Hudson in the request that the commission amend its rules so as to permit the use of case-hardened glass in all other parts of the car with the exception of the windshield.

Case-hardened glass is a sheet of glass which is reheated to plasticity and then subjected to a chilling blast of air on both surfaces. It is extensively used in automobiles in Europe and Canada. Laminated glass is made by glueing two thin sheets together to form one. At present the commission's rules provide that common and contract motor carriers are required to use laminated glass in the windshield, in the window next to the driver, in doors and rear of buses and in the rear window of a truck's driving compartment. The rule also provides that in the case of trucks and buses in use at the time of the promulgation of the rules, the laminated glass shall be used for all replacements, but that all new vehicles shall use the laminated type.

In reaching its decision, Division 5 made the following findings of fact:

1. That laminated safety glass will withstand a more severe blow from a small, hard missile without breaking than will case-hardened glass.

2. That when a pane of laminated safety glass is fractured, fewer particles of broken glass are separated therefrom than is the case if a pane of case-hardened glass is broken.

3. That laminated safety glass does not become translucent to the same degree as case-hardened glass when fractured.

4. That laminated safety glass may be broken and removed from the windshield and window frames by a blow from the hand, elbow, shoulder, or foot, and that case-hardened glass can only be broken by a blow from a sharp-pointed metal instrument.

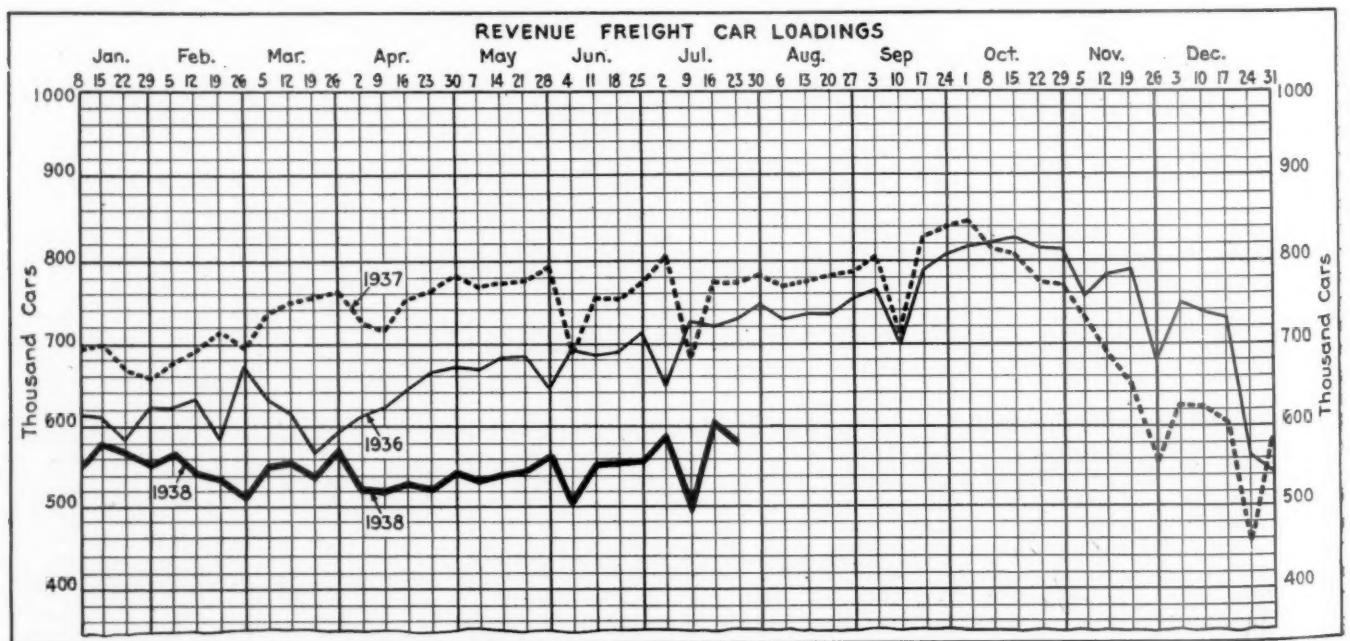
5. That when a serious accident occurs, occupants of motor vehicles and particularly buses may escape more readily if laminated safety glass is used than they could if case-hardened glass were used.

6. That laminated safety glass affords the occupants of a motor vehicle greater protection than does case-hardened glass and is of greater aid to the safety of operation of such vehicles.

The new rules will go into effect September 1 and will require that all replacements of glass shall be laminated glass and also that all new trucks and buses shall be entirely equipped with this type of glass.

Freight Car Loading

Loading of revenue freight for the week ended July 23 totaled 580,882 cars, a decrease of 21,418 cars or 3.6 per cent below the preceding week, a decrease of 186,588 cars or 24.3 per cent below the corresponding week in 1937 and a decrease of 347,389 cars or 37.4 per cent below the same week in 1930. All commodity classifications except coal and coke showed decreases under the preceding week, while all commodity classifications except live stock and grain showed decreases under last year. The summary, as compiled by the Car Service



Division, Association of American Railroads, follows:

Revenue Freight Car Loading			
For Week Ended Saturday, July 23			
Districts	1938	1937	1936
Eastern	119,228	155,613	152,700
Allegheny	105,184	157,929	147,996
Pocahontas	41,096	48,463	49,785
Southern	84,156	98,931	95,124
Northwestern	82,285	134,764	121,183
Central Western	103,003	119,053	108,952
Southwestern	45,930	52,717	55,241
Total Western Districts	231,218	306,534	285,376
Total All Roads	580,882	767,470	730,981
Commodities			
Grain and Grain Products	53,350	51,239	54,999
Live Stock	11,201	9,382	13,648
Coal	93,136	108,803	112,946
Coke	4,326	10,425	8,612
Forest Products	26,777	41,744	34,700
Ore	22,105	77,487	55,174
Merchandise l.c.l.	146,216	165,811	162,337
Miscellaneous	223,771	302,579	288,565
July 23	580,882	767,470	730,981
July 16	602,300	766,384	720,359
July 9	501,013	678,958	724,277
July 2	588,864	802,346	649,703
June 25	558,937	769,945	713,588
Cumulative Total, 29 Weeks	15,914,497	21,252,987	18,875,278

Recent R. F. C. Developments

While he saw "nothing new" in the general railroad situation, Chairman Jesse H. Jones of the Reconstruction Finance Corporation did reveal at his August 2 press conference that the lending agency has agreed, subject to Interstate Commerce Commission approval, to make a \$5,000,000 "work loan" to the New York Central and to make a \$9,500,000 loan to aid in financing the proposed merger of the Mobile & Ohio with the Gulf, Mobile & Northern. Also Mr. Jones told of a discussion he had earlier in the day with Senator Shipstead of Minnesota in connection with the latter's railroad equipment plan, revealing that although RFC is making no study of the plan he had told the Senator that he would be glad to participate in further discussions of the proposal at any time.

RFC approval of the Baltimore & Ohio's latest application for a \$6,000,000 loan is awaiting I. C. C. action, Mr. Jones said. He went on to explain that the lending agency had not acted in advance of the I. C. C. because of the abnormal business situation and the financial position of the road. In normal times, he added, the RFC often committed itself to a loan, subject to I. C. C. approval. In view of these remarks he did not explain the above-mentioned commitment to the New York Central.

In connection with the proposed acquisition of the M. & O. by the G. M. & N., Mr. Jones said that as he understood the situation the Southern is willing to sell and the G. M. & N. is willing to buy. Also, that the proposal has been taken up with the Interstate Commerce Commission where it "does not meet with disfavor."

Mr. Jones discussed Senator Shipstead's plan as though it were one which contemplated a program for the repairing of old railroad freight cars. However, it was learned from the Senator's office that his proposal is at present the same as that outlined to the Public Works Administration as reported briefly in the *Railway Age* of June 25 and in detail in the issue of

July 2, page 19. It is, in the words of Senator Shipstead, a "project to sell for scrap the 300,000 obsolete freight cars that are now nothing but a source of additional out-of-pocket cost to the roads and replace them with new and modern equipment." It contemplated that the government would place orders immediately for at least 300,000 freight cars and turn them over to the carriers under a lease-sale agreement extending over a period of some 15 to 20 years with interest at a rate of 2½ per cent on the unpaid balance.

Chairman Jones also made public a statement of loans authorized since the RFC resumed lending in the latter part of February. Since that time 11 railroad loans, aggregating \$45,385,591.35 have been authorized.

Streamliner City of Los Angeles to be Increased in Size

The Streamliner, City of Los Angeles, which the Union Pacific and the Chicago & North Western have operated between Chicago and Los Angeles since May 15, 1936, is being increased in size from two diesel electric power units and nine revenue cars to two diesel electric power units and eleven revenue cars through the addition of a chair car and an all-room Pullman sleeping car. The train, with several other changes, will be returned to service within a few weeks.

One of the major changes in the train is the conversion of a coach into an observation lounge car, which has not been carried on the train heretofore. This car, named The Copper King, will contain two innovations, copper trim for the interior and Polaroid discs with which the passenger can regulate the brightness of the sun entering the car. According to the railroad, this is the first railroad car in which copper has ever been used extensively for interior decorations, finishings and appointments. Side walls of the car are of satin finished copper paneling, furniture will have copper bronze frames, tables, smoking stands and other accessories will be of copper bronze, and much copper is being used in the construction of the car's buffet.

It is also claimed that it will be the first railroad car in the world to have natural sun "light conditioned" windows accomplished by the use of Polaroid discs. Twenty-nine of these circular windows are being installed in the car, thirteen on each side and three in the slightly circular end, one of them being in the rear door. Each window will be 27-in. in diameter and will consist of two laminated Polaroid discs mounted one over the other in such a way that the outward disc is stationary, while the inside disc can be revolved by turning a handle or knob. By merely turning the window handle, the passengers may adjust the brightness of the sun to the desired value.

Several other changes in the cars are involved as indicated in the following comparison of the consists of the two trains:

Consist of remodeled train	Consist of original train
2 power units	2 power units
1 mail, baggage, dormitory car	1 mail baggage car
2 chair cars	1 baggage, dormitory, kitchen
1 diner kitchen	1 diner lounge
1 diner	4 sleeping cars
5 sleeping cars	1 deluxe coach
1 observation car	1 coach buffet car

6 Months N. O. I. Was \$70,289,305

(Continued from page 224)

to earn expenses and taxes in the first six months of 1938, of which 23 were in the Eastern District, 9 in the Southern District and 29 in the Western District.

Class I railroads in June had a net railway operating income of \$25,000,803 or 1.18 per cent on investment. In June, 1937, their net railway operating income was \$59,354,317, or 2.80 per cent, and in June, 1930, was \$67,683,471 or 3.27 per cent. Gross operating revenues for June amounted to \$282,139,794 compared with \$351,651,222 in June, 1937, and \$439,377,179 in June, 1930. Operating expenses in June totaled \$218,192,353 compared with \$265,521,794 in the same month in 1937, and \$330,732,585 in June, 1930.

Class I railroads in the Eastern district for the first six months in 1938 had a net railway operating income of \$48,347,827, which was at the annual rate of return of 0.86 per cent; for the same period in 1937, their net was \$184,088,770 or 3.29 per cent on their property investment while in 1930 it was \$215,790,724 or 4.06 per cent. Gross for the first six months in 1938 totaled \$779,284,280, a decrease of 26.7 per cent compared with 1937, and a decrease of 42.1 per cent compared with 1930. Operating expenses totaled \$618,716,342, a decrease of 18.5 per cent below the same period in 1937, and a decrease of 39.0 per cent under the first six months of 1930.

Class I railroads in the Eastern district for the month of June had a net railway operating income of \$13,965,460 compared with \$27,120,393 in June, 1937, and \$38,056,351 in June, 1930.

Class I railroads in the Southern district for the first six months of 1938 had a net railway operating income of \$20,911,130, which was at the annual rate of return of 1.36 per cent. For the same period in 1937, their net amounted to \$42,067,176, or 2.72 per cent, and for the same period in 1930 was \$42,941,024 or 2.64 per cent. Gross in the Southern district for the first six months in 1938 amounted to \$229,764,336, a decrease of 14.4 per cent compared with the same period in 1937, and a decrease of 32.8 per cent under the same period in 1930. Operating expenses totaled \$179,717,239, a decrease of 9.2 per cent below the same period in 1937, and a decrease of 33.6 per cent under 1930.

Class I railroads in the Southern district for the month of June had a net railway operating income of \$2,337,745 compared with \$5,991,726 in June, 1937, and \$4,045,590 in June, 1930.

Class I railroads in the Western district for the first six months in 1938 had a net railway operating income of \$1,030,348 which was at the annual rate of return of 0.03 per cent on their property investment. For the same six months in 1937, the railroads in that district had a net railway operating income of \$73,310,358 which was at the annual rate of return of 2.17 per cent, and for the same period in 1930 was \$110,684,503 or 2.97 per cent. Gross in the Western district for the first six months' period in 1938 amounted to \$627,-

359,879, a decrease of 17 per cent below the same period in 1937, and a decrease of 35.4 per cent under the same period in 1930. Operating expenses totaled \$533,528,748, a decrease of 11.2 per cent compared with the same period in 1937, and a decrease of 30.1 per cent under the same period in 1930.

For the month of June alone, the Class I railroads in the Western district reported a net railway operating income of \$8,697,598 compared with \$26,242,198 in June, 1937, and \$25,581,530 in June, 1930.

Deadline for Pay Plan Set by Court

(Continued from page 225)

effective August 1, and to all other persons who are making large gifts of money and wonderful efforts to keep the road running by increasing good will and soliciting traffic, the court says emphatically, 'Thank you.' The employees can and should continue in their employment (I hope they do that) and thus give you the chance you are asking to increase the traffic and the income and make their employment permanent. Increased income is the only way they can get their overdue pay in full after next Thursday."

In his directions the judge set August 2 as the date for a session at the court house, Rutland, Vt., to hear employees in formal or informal complaints on the wage plan. According to reports of the meeting which have been received, when Judge Howe asked those employees and their representatives present for suggestions toward the solution of the railroad's financial plight no response was made and the session was adjourned without further action.

In response to the receiver's request for aid from communities along the line, Chambers of Commerce in various points touched by the road have organized a drive for subscription to provide a fund for a new organization, to be known as the Rutland Railroad Co-operating Traffic Association. The proposal, which was presented by Richard Overton of Manchester, Vt., instructor of American history at Amherst College, and John W. Wright of Fairfield, Conn., business manager of fraternities at Amherst, called for the issuance of up to 100,000 shares of stock at \$5 per share to be sold to shippers, passengers and other interested parties. Each shareholder would have one vote, regardless of the number of shares held. The sponsors also submitted a prepared estimate of revenues and costs which showed that the Rutland could be operated at a profit if the 15 per cent wage reduction now under negotiation be effected and taxes reduced in the amounts suggested heretofore by the receiver.

The plan further stipulated that any such surplus from operation of the road be divided three ways,—one-third to employees until their wages be restored to the present rate, one-third to bondholders and one-third to "customers" of the road prorated on the basis of their payments in freight rates or passenger fares.

Meetings and Conventions

The following list gives names of secretaries, dates of next or regular meetings and places of meetings:

AIR BRAKE ASSOCIATION.—R. P. Ives, Westinghouse Air Brake Co., 350 Fifth Ave., New York, N. Y.

ALLIED RAILWAY SUPPLY ASSOCIATION.—J. F. Gettrust, P. O. Box 5522, Chicago, Ill.

AMERICAN ASSOCIATION OF FREIGHT TRAFFIC OFFICERS.—W. R. Curtis, F. T. R., M. & O. R. R., 327 S. La Salle St., Chicago, Ill.

AMERICAN ASSOCIATION OF GENERAL BAGGAGE AGENTS.—E. P. Soebbing, 1431-B Railway Exchange Bldg., St. Louis, Mo. Annual meeting, October 11-13, 1938, San Francisco, Cal.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—B. D. Branch, C. R. R. of N. J., 143 Liberty St., New York, N. Y.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—F. O. Whiteman, Union Station, St. Louis, Mo. Annual meeting, 1939, Chicago, Ill.

AMERICAN ASSOCIATION OF RAILWAY ADVERTISING AGENTS.—E. A. Abbott, Poole Bros., Inc., 85 W. Harrison St., Chicago, Ill. Annual meeting, January 20-21, 1939, Philadelphia, Pa.

AMERICAN ASSOCIATION OF SUPERINTENDENTS OF DINING CARS.—F. R. Berger, C. I. & L. Ry., 836 S. Federal St., Chicago, Ill. Annual meeting, October 10-12, 1938, St. Louis, Mo.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, 319 N. Waller Ave., Chicago, Ill. Annual meeting, October 18-20, 1938, Hotel Stevens, Chicago, Ill.

AMERICAN RAILWAY CAR INSTITUTE.—W. C. Tabbert, 19 Rector St., New York, N. Y.

AMERICAN RAILWAY DEVELOPMENT ASSOCIATION.—E. J. Hoddy (Second Vice-Pres.), Louisville & Nashville R. R., Louisville, Ky.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—Works in co-operation with the Association of American Railroads, Engineering Division. —W. S. Lacher, 59 E. Van Buren St., Chicago, Ill. Annual meeting, March 14-16, 1939, Palmer House, Chicago, Ill.

AMERICAN RAILWAY MAGAZINE EDITORS' ASSOCIATION.—M. W. Jones, Baltimore & Ohio R. R., 1105 B. & O. R. R. Bldg., Baltimore, Md. Fall meeting, October 14-15, 1938, La Salle Hotel, Chicago, Ill.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—G. G. Macina, C. M. St. P. & P. R. R., 11402 Calumet Ave., Chicago, Ill.

AMERICAN SHORT LINE RAILROAD ASSOCIATION.—R. E. Schindler, Union Trust Bldg., Washington, D. C. Annual meeting, October 17-18, 1938, Chicago, Ill.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—C. E. Davies, 29 W. 39th St., New York, N. Y. Annual meeting, December 5-9, 1938, 29 W. 39th St., New York, N. Y.

Railroad Division.—Marion B. Richardson, 21 Hazel Ave., Livingston, N. J.

AMERICAN TRANSIT ASSOCIATION.—Guy C. Heckler, 292 Madison Ave., New York, N. Y. Annual meeting, October 3-6, 1938, Royal York Hotel, Toronto, Canada.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—H. L. Dawson, 1427 Eye St., N. W., Washington, D. C. Annual meeting, January 24-26, 1939, Willard Hotel, Washington, D. C.

ASSOCIATION OF AMERICAN RAILROADS.—H. J. Forster, Transportation Bldg., Washington, D. C.

Operations and Maintenance Department.—J. M. Symes, Vice-President, Transportation Bldg., Washington, D. C.

Operating-Transportation Division.—L. R. Knott, 59 E. Van Buren St., Chicago, Ill.

Transportation Section.—L. R. Knott, 59 E. Van Buren St., Chicago, Ill.

Freight Station Section.—L. R. Knott, 59 E. Van Buren St., Chicago, Ill.

Operating Section.—J. C. Caviston, 30 Vesey St., New York, N. Y.

Medical and Surgical Section.—J. C. Caviston, 30 Vesey St., New York, N. Y.

Protective Section.—J. C. Caviston, 30 Vesey St., New York, N. Y.

Safety Section.—J. C. Caviston, 30 Vesey St., New York, N. Y.

Telegraph and Telephone Section.—W. A. Fairbanks, 30 Vesey St., New York, N. Y.

Engineering Division.—W. S. Lacher, 59 E. Van Buren St., Chicago, Ill. Annual meeting, March 14-16, 1939, Palmer House, Chicago, Ill.

Construction and Maintenance Section.—W. S. Lacher, 59 E. Van Buren St., Chicago, Ill. Annual meeting, March 14-16, 1939, Palmer House, Chicago, Ill.

Electrical Section.—W. S. Lacher, 59 E. Van Buren St., Chicago, Ill.

Signal Section.—R. H. C. Balliet, 30 Vesey St., New York, N. Y.

Mechanical Division.—V. R. Hawthorne, 59 E. Van Buren St., Chicago, Ill.

Electrical Section.—J. A. Andreucetti, 59 E. Van Buren St., Chicago, Ill.

Purchases and Stores Division.—W. J. Farrell, 30 Vesey St., New York, N. Y.

Freight Claims Division.—Lewis Pilcher, 59 E. Van Buren St., Chicago, Ill.

Motor Transport Division.—George M. Campbell, Transportation Bldg., Washington, D. C.

Car-Service Division.—E. W. Coughlin, Transportation Bldg., Washington, D. C.

Finance, Accounting, Taxation and Valuation Department.—E. H. Bunnell, Vice-President, Transportation Bldg., Washington, D. C.

Accounting Division.—E. R. Ford, Transportation Bldg., Washington, D. C.

Treasury Division.—E. R. Ford, Transportation Bldg., Washington, D. C.

Traffic Department.—A. F. Cleveland, Vice-President, Transportation Bldg., Washington, D. C.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—F. L. Johnson, Claim Agent, Alton R. R., 340 W. Harrison St., Chicago, Ill.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—W. S. Carlisle, National Lead Company, 900 W. 18th St., Chicago, Ill. Meets with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—C. R. Crook, 4468 Oxford Ave., N. D. G., Montreal, Que. Regular meetings, second Monday of each month, except June, July and August, Windsor Hotel, Montreal, Que.

CAR DEPARTMENT ASSOCIATION OF ST. LOUIS, MO.—J. J. Sheehan, 1101 Missouri Pacific Bldg., St. Louis, Mo. Regular meetings, third Tuesday of each month except June, July and August, Hotel Mayfair, St. Louis, Mo.

CAR DEPARTMENT OFFICERS' ASSOCIATION.—Frank Kartheiser, Chief Clerk, Mechanical Dept., C. & B. & Q., Chicago, Ill.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—G. K. Oliver, 2514 W. 55th St., Chicago, Ill. Regular meetings, second Monday of each month, except June, July and August, La Salle Hotel, Chicago, Ill.

CENTRAL RAILWAY CLUB OF BUFFALO.—Mrs. M. D. Reed, 1817 Hotel Statler, McKinley Square, Buffalo, N. Y. Regular meetings, second Thursday of each month, except June, July and August, Hotel Statler, Buffalo, N. Y.

EASTERN ASSOCIATION OF CAR SERVICE OFFICERS.—J. T. Bougher, 424 W. 33rd St. (11th floor), New York, N. Y. Next meeting, September 29, 1938, New York, N. Y.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—F. T. James, General Foreman, Delaware, Lackawanna & Western, Kingsland, N. J.

INTERNATIONAL RAILWAY MASTER BLACKSMITHS' ASSOCIATION.—W. J. Mayer, Michigan Central R. R., Detroit, Mich.

MASTER BOILER MAKERS' ASSOCIATION.—A. F. Stiglmeier, 29 Parkwood St., Albany, N. Y.

NATIONAL ASSOCIATION OF RAILROAD AND UTILITIES COMMISSIONERS.—Clyde S. Bailey, 806-808 13th and E Sts., N. W., Washington, D. C. Annual meeting, November 15-18, 1938, New Orleans, La.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. H. White, Room 1826, 208 S. La Salle St., Chicago, Ill.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, second Tuesday of each month, except June, July, August and September, Hotel Touraine, Boston, Mass.

NEW YORK RAILROAD CLUB.—D. W. Pye, 30 Church St., New York, N. Y. Regular meetings, third Friday of each month, except June, July, August, September and December, 29 W. 39th St., New York, N. Y.

PACIFIC RAILWAY CLUB.—William S. Wollner, P. O. Box 3275, San Francisco, Cal. Regular meetings, second Thursday of each month, alternately at San Francisco and Oakland, except June at Los Angeles and October at Sacramento.

RAILWAY BUSINESS ASSOCIATION.—P. H. Middleton, First National Bank Bldg., Chicago, Ill.

RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, 1941 Oliver Bldg., Pittsburgh, Pa. Regular meetings, fourth Thursday of each month, except June, July and August, Fort Pitt Hotel, Pittsburgh, Pa.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—J. McC. Price, Allen-Bradley Company, 600 W. Jackson Blvd., Chicago, Ill.

RAILWAY FIRE PROTECTION ASSOCIATION.—P. A. Bissell, 40 Broad St., Boston, Mass. Annual meeting, October 18-19, 1938, Palmer House, Chicago, Ill.

RAILWAY FUEL AND TRAVELING ENGINEERS' ASSOCIATION.—T. Duff Smith, 1255 Old Colony Bldg., Chicago, Ill.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 1941 Oliver Bldg., Pittsburgh, Pa. Meets with Mechanical Division

and Purchases and Stores Division, Association of American Railroads.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, Waterbury Battery Company, 30 Church St., New York, N. Y. Meets with Telegraph and Telephone Section of A. A. R.

RAILWAY TIE ASSOCIATION.—Roy M. Edmonds, 903 Syndicate Trust Bldg., St. Louis, Mo. **ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.**—C. A. Lichty, 319 N. Waller Ave., Chicago, Ill. Annual meeting, September 20-22, 1938, Hotel Stevens, Chicago, Ill.

SIGNAL APPLIANCE ASSOCIATION.—G. A. Nelson, Waterbury Battery Company, 30 Church St., New York, N. Y. Meets with A. A. R., Signal Section.

SOCIETY OF OFFICERS, UNITED ASSOCIATIONS OF RAILROAD VETERANS.—J. W. O'Neill, 310 Academy St., South Orange, N. J. Annual meeting, October 8, 1938, Great Northern Hotel, Chicago, Ill.

SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.—A. T. Miller, 4 Hunter St., S. E., Atlanta, Ga. Regular meetings, third Thursday in January, March, May, July, September and November, Ansley Hotel, Atlanta, Ga.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—D. W. Brantley, C. of Ga. Ry., Savannah, Ga.

TORONTO RAILWAY CLUB.—D. M. George, P. O. Box 8, Terminal "A," Toronto, Ont. Regular meetings, fourth Monday of each month, except June, July and August, Royal York Hotel, Toronto, Ont.

TRACK SUPPLY ASSOCIATION.—Lewis Thomas, O. & C. Company, 59 E. Van Buren St., Chicago, Ill. Meets with Roadmasters' and Maintenance of Way Association.

WESTERN RAILWAY CLUB.—C. L. Emerson, C. M., St. P. & P., Chicago, Ill. Regular meetings, third Monday of each month, except June, July, August and September, Hotel Sherman, Chicago, Ill.

Equipment and Supplies

FREIGHT CARS

THE SOUTHERN has placed orders for 153 additional freight cars in connection with orders for 5,550 freight cars reported in the *Railway Age* of May 7, page 819, bringing total orders to date for the group to 5,703 cars. The additional cars ordered are as follows:

No.	Type	Capacity, tons	Builder
23	Box	40	Pullman-Standard
20	Box	40	Mt. Vernon
95	H. S. gondola	50	Amer. Car & Fdy.
3	Stock	40	Ralston Steel
11	L. S. gondola	50	Pressed Steel
1	Flat	70	Greenville Steel

PASSENGER CARS

THE SOUTHERN is expecting to send out inquiries for six Diesel-electric powered, two-car passenger trains. It was previously reported in the *Railway Age* of April 30, page 783, that the road contemplated the purchase of four Diesel-electric passenger units.

IRON AND STEEL

THE CHICAGO, ROCK ISLAND & PACIFIC has ordered 400 tons of structural steel for a bridge at Bureau, Ill., from the American Bridge Company.

MOTOR VEHICLES

THE SANTA FE TRAIL TRANSPORTATION COMPANY has ordered from the American Car & Foundry Motors Company, 10 buses, powered with Hall-Scott horizontal engines.

Construction

P. W. A. Projects

Public Works Administrator Ickes has announced Presidential approval of additional non-federal P. W. A. projects, including street improvements involving grade separations in Los Angeles, Calif., and Washington, Pa. The Los Angeles project, which is expected to cost \$264,600, proposes street improvements at two locations—one on South Figueroa street from Lomita boulevard to Wilmington and San Pedro road, including a bridge over railroad tracks. The Washington, Pa., project will cost \$227,849; it calls for a street viaduct across the Pennsylvania's tracks from Jefferson avenue at Third street to Ewing street at Hillside avenue.

GOLD COAST.—Because definite prospect of the construction of a proposed line has not been shown, the Interstate Commerce Commission, Division 4, has canceled a certificate authorizing construction of a line by this company from Port Orford, Ore., to a connection with the main line of the Southern Pacific at Leland, 90 miles.

GULF, COLORADO & SANTA FE.—A contract has been awarded the Austin Bridge Company, Dallas, Tex., for the construction of an overpass for State Highway No. 146 over the tracks of this railroad at Galveston, Tex. The structure will consist of 27 concrete girder spans 40 ft. long, and five I-beam spans 45 ft. long, on concrete interior bents and abutments, providing two 24-ft. roadways with 1½-ft. curbs and ornamental steel railings, and will cost \$224,943.

PENNSYLVANIA.—This road has been authorized by the New York Public Service Commission to do certain work at actual cost in connection with the elimination of grade crossings of the railroad in Elmira, N. Y., without contract limited to \$43,716. The work includes changes in its eastward block and westward distance signals, shifting water lines, additions to air and steam outlets, changes in its tracks, telephone and telegraph system and raising miscellaneous yard facilities. The grade crossing elimination project in Elmira involves the proposed elimination of Pennsylvania crossings at South Main street, Miller street, South avenue and La France street.

SOUTHERN PACIFIC.—A contract has been awarded John F. Buckner, Cleburne, Tex., by the State of Texas, State Highway Department, for the construction of an underpass and roadway approaches which will carry State Highway No. 40 under the Texas & New Orleans (Southern Pacific) near Elam, Tex. The structure, which will consist of one 72-ft. through plate girder center span and two 54-ft. through plate girder approach spans on spread footing type abutments and piers, will cost \$34,396.

Supply Trade

Ludwig Emde has been appointed Detroit district sales manager of the **Worthington Pump and Machinery Corporation**, Harrison, N. J.

Robert E. Brown, 311 Ross street, Pittsburgh, Pa., has been appointed representative in the Pittsburgh territory for the **Ohio Electric Manufacturing Company**, Cleveland, Ohio.

Melvin B. Ericson, at one time associated with Houdaille-Hershey Corporation, has been elected president of the **Pettibone-Mulliken Corporation**, Chicago.

The **Dravo-Doyle Company**, Pittsburgh, Pa., will represent the **McKay Company**, Pittsburgh, as distributor for its arc-welding electrodes, in the territory of the "Tri-state" area, including Western Pennsylvania, Eastern Ohio and West Virginia.

D. H. Bell has joined the organization of the **Electric Service Supplies Co.**, with headquarters at Philadelphia, Pa., as a research engineer in the transportation field. Mr. Bell has been connected with the Pittsburgh Railways Co., for the past 18 years.

J. W. Herman has been elected treasurer of **Lukens Steel Company**, succeeding **George Thomas, 3rd**, deceased. Mr. Herman joined Lukens in 1916, as a clerk in the accounting department and after successive promotions was elected assistant secretary and assistant treasurer of the company in 1925, in which capacity he served continuously until his recent election as treasurer.

V. B. Emrick, representative of the **Westinghouse Air Brake Company** at St. Louis, Mo., since 1930, has been transferred in the same capacity to the southeastern district at Washington, D. C. Mr. Emrick, after serving with the Atchison, Topeka & Santa Fe, was employed by the Locomotive Stoker Company. He entered the employ of the Westinghouse Air Brake Company in 1929 as mechanical expert at the St. Paul, Minn., office and a year later he was appointed representative at St. Louis.

At the annual meeting of the **Mt. Vernon Car Mfg. Company**, the officers were re-elected by the directors. The directorate, however, was changed somewhat and now consists of the following: David C. Arthurs, president, and L. G. Sever, executive vice-president of the Mt. Vernon Car Mfg. Company; C. W. Reynolds, president of the J. P. Devine Mfg. Company, Mt. Vernon, Ill.; Stanley W. Butler, Richmond, Va.; John Shepley, vice-president of the St. Louis Union Trust Company, St. Louis, Mo.; E. B. Appleton, vice-president of the Litchfield Bank & Trust Co., Litchfield, Ill.; D. K. Kinder, an attorney in Litchfield, Ill.

Edward S. Coe, Jr., has been assigned by the **Farrel-Birmingham Company**,

Inc., to its branch sales office in Chicago. Here, he will be engaged in the promotion of sales of Farrel-Sykes herringbone gears and gear units. Born in Worcester, Mass., Mr. Coe attended the public schools of that city and received his engineering education at Worcester Polytechnic Institute, graduating in 1931. After graduation, Mr. Coe was associated with the American Steel & Wire Co., and the Reed-Prentice Company, before joining the Farrel-Birmingham organization at Buffalo, N. Y., as sales engineer.

James Suttie has been appointed general manager in charge of sales and production, Industrial division, of **American Steel Foundries**.

E. S. Berry, resident manager of the Montreal office of the **Union Switch & Signal Co.**, has been transferred to the New York office as assistant district manager. As assistant district manager he will continue to handle all matters relating to the company's business in Canada. Mr. Berry was born in Sherbrooke, N. D., on December 23, 1886. He attended the university of Maine, graduating in 1910, after which he entered the employ of the General Electric Company. In 1910 he entered the signal department of the New York Central where he remained until 1912 when he became a foreman for the Hall Switch & Signal Co. He remained in this position until 1914, when he returned to the New York Central signal department. Later in the same year he became a foreman for the Federal Signal Company, and in the following year returned to the New York Central signal department where he remained until 1922, serving as foreman, circuit draftsman, circuit engineer and signal inspector. From 1922 to 1925 he was employed by the Hall Signal Company as sales engineer, transferring to the sales department of the Union Switch & Signal Co., on December



E. S. Berry

1, 1925. He had headquarters in the New York office until he was transferred to the Montreal office as resident manager on May 1, 1928 which position he held until his recent appointment.

OBITUARY

Herbert M. Wilcox, manager of the New Products division, of the Westinghouse Electric & Manufacturing Co., died suddenly from heart disease on July 23, in New York City. As manager of the newly-created New Products division, Mr. Wilcox had played an active part in introducing the Westinghouse precipitron, an electrostatic air cleaner, which is expected to revolutionize the air conditioning industry.

Samuel L. Shober, assistant to the president, Union Switch & Signal Co., with headquarters at Philadelphia, Pa.,



Blank & Stoller

Samuel L. Shober

died in that city on July 18, after 23 years of service with the company. He was born in Philadelphia in 1862 and received his early education at St. Paul's School, Concord, N. H. He then entered the United States Military Academy, graduating in 1883, after which he attended the School of Engineering, University of Pennsylvania, completing his work there in 1885. In that year, he entered the service of the Pennsylvania and served in various capacities in the motive power and operating departments until 1901, when he went with the banking firm of Brown Bros. & Co., Philadelphia. In 1904, he became a member of the firm of Cramp, Mitchell & Shober, also in Philadelphia. Here he remained until 1912, when he joined the staff of the Protective Signal Manufacturing Company, Denver, Col. In 1915 he entered the service of the Union Switch & Signal Co., as assistant to the president, in which capacity he remained until the time of his death.

TRADE PUBLICATION

"**MOLYBDENUM IN STEEL**."—In this compilation of 12 sections the Climax Molybdenum Company, 500 Fifth avenue, New York, presents useful data on all types of molybdenum steels, both wrought and cast, steel for elevated temperature service, corrosion-resisting steels, and cast steels. The book, in loose-leaf form, is bound with imitation leather and is comprehensively indexed.

Financial

ALLEGHANY CORPORATION.—*SEC Investigation Ordered.*—The Securities and Exchange Commission has issued a report charging this company, top holding company of the so-called Van Sweringen rail system, with making "false and misleading statements concerning its assets, liabilities, profit and loss and surplus accounts" in its financial statement for the years 1934 to 1937 inclusive. These charges were contained in an order issued by the commission instituting an investigation of all of the approximately \$200,000,000 of the company's listed securities. The inquiry will be concerned with the accuracy of the financial statements which are the subject of the commission's complaint.

The investigation will begin on August 11 before Examiner Richard Townsend, with Smith W. Brookhart, Jr., as the commission's counsel. Direct testimony will be taken, and it is expected that all of the surviving officers, directors and principal stockholders of the company will be called as witnesses. The investigation will take the form of an ex parte proceeding in which the commission can place its evidence in the record. After the investigation, the commission will decide whether or not a delisting of the company's securities on the various exchanges of the country is justified.

BALTIMORE & OHIO.—*Tentative interest plan.*—This road has under consideration a plan for the readjustment of its interest and certain maturities "with a view to such readjustment as would place the credit of the road on a more stable basis and relieve the road of a certain amount of fixed interest, placing same on a contingent basis,—that is payable if and when earned," according to a brief statement issued by G. M. Schriver, senior vice-president of the road. While not affecting any principal obligation or relieving the road from the ultimate payment of interest, the plan, it is expected, would place a portion of the interest on the refunding and general bonds and certain other of the mortgage bonds on a fixed basis and the balance and the convertible bonds on a contingent basis.

ERIE.—*Trustee for the Nypano.*—Charles E. Denney, a co-trustee of the Erie, has asked the Interstate Commerce Commission to ratify his appointment as trustee of the Nypano.

GULF, MOBILE & NORTHERN.—*Abandonment.*—This company has asked the Interstate Commerce Commission for authority to abandon operation over a line of the Illinois Central between Bemis, Tenn., and Paducah, Ky., 113 miles, and also over terminal facilities of the Nashville, Chattanooga & St. Louis in Paducah, Ky. This action was occasioned by the failure of this company to secure from the Illinois Central certain modifications in its operating agreement.

ILLINOIS CENTRAL.—*Bonds of the Chicago, Madison & Northern.*—The Interstate Commerce Commission, Division 4, has authorized the Chicago, Madison &

Northern to extend from December 1, 1935, to April 2, 1952, the date of maturity of \$4,370,000 of first mortgage gold bonds.

ILLINOIS CENTRAL.—Bonds of the Cedar Rapids & Chicago.—The Interstate Commerce Commission, Division 4, has authorized the Cedar Rapids & Chicago to extend to April 2, 1952, the maturity date of \$830,000 of its first mortgage gold bonds, payable December 1, 1935, the interest rate for the extended period to continue at five per cent.

MINNEAPOLIS & ST. LOUIS.—Abandonment.—The co-receivers have asked the Interstate Commerce Commission to reopen and reconsider Finance Docket No. 10,910 insofar as authority was requested to abandon and dismantle a line between Laurel, Iowa, and Van Cleve, 6.8 miles.

MOBILE & OHIO.—Abandonment.—The Interstate Commerce Commission, Division 4, has authorized the receivers to abandon the operation and the Warrior Southern to abandon its entire line extending from Tidewater, Ala., to Kellerman, 13.7 miles.

NEW YORK CENTRAL.—Bonds of the Boston & Albany.—The Interstate Commerce Commission, Division 4, has authorized the Boston & Albany to issue \$3,015,000 of main-line first mortgage 4½ per cent bonds, series B, to be delivered to the New York Central in discharge of obligations incurred by its lease agreement. The commission has also authorized the New York Central to assume liability, as guarantor, for these bonds.

NEW YORK CENTRAL.—Bonds of the Kalamazoo, Allegan & Grand Rapids.—The Interstate Commerce Commission, Division 4, has authorized the Kalamazoo, Allegan & Grand Rapids to extend from July 1, 1938, to July 1, 1968, the date of maturity of \$840,000 of five per cent first mortgage bonds. The commission has also authorized the New York Central, as lessee and endorser, to assume liability for the payment of the principal and interest on the bonds as extended.

NEW YORK, CHICAGO & ST. LOUIS.—Notes.—This company has applied to the Interstate Commerce Commission for authority to issue \$15,000,000 of promissory notes, bearing interest at the rate of six per cent and maturing on October 1, 1941. These notes will be exchanged for a like amount of three-year six per cent notes which will become due on October 1, providing the present note holders are willing. The company has notified the note holders that if this offer is not accepted, it will be necessary for the company to apply for reorganization under Section 77 of the Bankruptcy Act.

PENNSYLVANIA.—Abandonment.—This company has applied to the Interstate Commerce Commission for authority to abandon the operation and the Philadelphia, Baltimore & Washington has asked permission to abandon the Pomeroy branch extending from Newark Centre, Del., to Thompson, 3 miles.

PITTSBURGH & WEST VIRGINIA.—Notes.

—This company has asked the Interstate Commerce Commission for authority to issue, reissue, extend, or renew its unsecured note or notes in an aggregate face amount of \$250,000, maturing not more than two years after the date of issue with interest at the rate of five per cent.

PITTSBURGH & WEST VIRGINIA.—Pledge of Collateral.—This company has asked the Interstate Commerce Commission for authority to pledge and repledge from time to time to and including June 30, 1940, as collateral security for the promissory notes of the company at present outstanding, or notes lawfully issued by the company in renewal or substitution for said outstanding notes, not exceeding \$3,576,000 of its first mortgage gold bonds, series D, and \$8,047,000 of its general mortgage six per cent gold bonds, said pledge or pledges to be at a ratio not to exceed \$125 of bonds in value at their prevailing market price at the time of pledge to \$100, face amount, of notes, and (b) to pledge and repledge from time to time to and including June 30, 1940, as collateral security for the promissory notes of the company at present outstanding, or notes lawfully issued by the company in renewal or substitution for said outstanding notes, the company's equity at any time remaining or existing in said \$3,576,000 of the company's first mortgage gold bonds, series D, and in said \$8,047,000 of general mortgage six per cent gold bonds, without limiting the ratio of market price of equity in bonds pledged to face amount of the notes.

RAILWAY EXPRESS AGENCY.—Purchase of Southeastern Express.—The Interstate Commerce Commission, Division 5, has authorized this company to lease the operating rights and property of the Southeastern Express Company for a period of 180 days. The R. E. A. had applied for authority to temporarily lease the properties for 180 days and for authority to purchase the properties and operating rights of the Southeastern. The commission will set a hearing on the purchase phase of the application.

WABASH.—Abandonment.—The receivers have asked the Interstate Commerce Commission for authority to abandon a branch line extending from Sullivan, Ill., to Stewardson, 24.1 miles.

WESTERN MARYLAND.—Operation.—This company has applied to the Interstate Commerce Commission for authority to operate under a contract over lines of the Cumberland & Pennsylvania between Westernport, Md., and Lonaconing Junction, 10.2 miles.

Dividends Declared

Cleveland & Pittsburgh.—Guaranteed, 87½c, quarterly; Special Guaranteed, 50c, quarterly, both payable September 1 to holders of record August 10.

Pittsburgh, Youngstown & Ashtabula.—Preferred, \$1.75, quarterly, payable September 1 to holders of record August 20.

Average Prices of Stocks and Bonds

	Aug. 2	Last week	Last year
Average price of 20 representative railway stocks..	28.87	30.18	50.61
Average price of 20 representative railway bonds..	61.42	61.96	79.39

Railway Officers

EXECUTIVE

William H. Corbett, assistant to chief operating officer on the Minneapolis, St. Paul & Sault Ste. Marie, with headquarters at Minneapolis, Minn. retired on August 1. Mr. Corbett was born at Chipewewa Falls, Wis., on May 11, 1871, and entered railway service in April, 1889 as a telegraph operator on the Soo Line. In May, 1892 he was promoted to train dispatcher, and in October, 1901, he was advanced to chief train dispatcher on the Missouri river division. He subsequently served as a chief train dispatcher on the Winnipeg, Duluth-Superior, and Wisconsin and Peninsula divisions. Mr. Corbett was promoted to trainmaster of the Minnesota division in 1914 and was transferred to the Wisconsin and Peninsula division in 1916. He was promoted to superintendent of the Gladstone division, with headquarters at Weyerhaeuser, Wis., in April, 1925, and later was transferred to the Minnesota division with headquarters at Enderlin, N. D. In March, 1931 Mr. Corbett was advanced to assistant to the vice-president and general manager with headquarters at Minneapolis, and has continued to hold that position until this year when his title was recently changed to assistant to chief operating officer.

Albert M. Hartung, general solicitor of the Railway Express Agency, has been appointed vice-president in charge of personnel, succeeding **Lewis R. Gwyn**, who has retired after more than 46 years in the express business. Mr. Hartung was formerly attorney for the Erie and entered



Albert M. Hartung

the express service in 1917. He is a member of the bar of the Supreme Court of the United States, of the Federal Circuit Court of Appeals of several circuits, American Bar Association and the Association of Practitioners before the Interstate Commerce Commission. As general solicitor, Mr. Hartung has had charge of the company's litigation and has argued a number of important cases in the Supreme Court and handled many of the express

cases before the I. C. C. and various state commissions.

Mr. Gwyn first entered the express business as an errand boy in a New York office in 1892 and in 1912, after holding various operating positions with the American Express Company, predecessor company of the Railway Express Agency, he was assigned to open offices for his company on the Western Maryland railroad, including Baltimore. Mr. Gwyn subsequently went to Philadelphia and Buffalo where he was in charge of the Atlantic department and the Empire State department, respectively. Since 1918 Mr. Gwyn's work has been principally in employee relations activities. During his years of express service he has held outstanding positions on labor relations boards and councils. In 1924 Mr. Gwyn was appointed vice-president in charge of personnel and has maintained active contact with every labor union dealing with express employees. Mr. Gwyn was also chairman of the Committee on Industrial Relations and Problems of the New York State Chamber of Commerce; past member of the Railway Express Pension Board; and past president of the Society



Lewis R. Gwyn

of Terminal Engineers. He also served as a director of the Expressmen's Mutual Life Insurance Company.

Luis G. Morphy, whose appointment as receiver of the Rutland, at Rutland, Vt., was reported in the *Railway Age* of July 16, was born at Orizaba, Vera Cruz, Mexico, on December 4, 1876. He attended Spring Hill College, Mobile, Ala., receiving his bachelor of science degree in 1897, and also attended Rensselaer Polytechnic Institute, Troy, N. Y. He entered railway service in 1900 as transitman with the New York Central, serving successively as supervisor of track, assistant engineer, resident engineer and assistant to principal assistant engineer. In 1907 Mr. Morphy became assistant engineer maintenance of way and construction of the Boston & Albany, then serving as assistant to chief engineer, designing and division engineer and principal assistant engineer, consecutively. In 1920 he became manager in South America of the Foundation Company of New York. From 1921 to 1926, he served as chief engineer of the Rutland,

becoming general superintendent and chief engineer in 1926. On December 15, 1937, Mr. Morphy was appointed general manager and chief engineer, which positions he held at the time of his appointment as



Luis G. Morphy

receiver of the road. Mr. Morphy is a member of the Boston Society of Civil Engineers, the American Railway Engineering Association, the American Society of Military Engineers, the Vermont Society of Engineers and the American Association of Railroad Superintendents.

FINANCIAL, LEGAL AND ACCOUNTING

G. B. Herbert, assistant auditor on the Southern Pacific in Texas & Louisiana, with headquarters at Houston, Tex., has been promoted to secretary and auditor, with the same headquarters, succeeding **C. R. Cottingham**, who retired August 1. **Joseph F. Elliott**, assistant auditor at Houston, has been promoted to assistant secretary at that point.

OPERATING

S. J. Faight, assistant superintendent of the Canadian National at Capreol, Ont., has been appointed transportation inspector, Central region, with headquarters at Toronto, Ont.

F. S. Allison, chief dispatcher on the Atchison, Topeka & Santa Fe at Slaton, Tex., has been promoted to trainmaster on the Panhandle division, with headquarters at Wellington, Kan., succeeding **D. L. Badgley**.

J. F. Carrigan, assistant superintendent of the Rutland, with headquarters at Malone, N. Y., has retired from the service of that road, effective July 31. Mr. Carrigan has been in railroad service for nearly 58 years, and for 46 years has been continuously in the employ of the Rutland and predecessor companies.

Quin Baker, division engineer, St. Louis-San Francisco, with headquarters at Fort Scott, Kan., has been promoted to assistant superintendent at that point succeeding **F. H. Donaldson**, who has been transferred to Springfield, Mo., to replace **A. M. Ball**, whose promotion to assistant

superintendent of transportation at Springfield was noted in the *Railway Age* of July 23.

Fred W. Ferguson, assistant superintendent on the St. Louis Southwestern, with headquarters at Tyler, Tex., has been transferred to Pine Bluff, Ark., to succeed **Edgar H. McFadden**, whose retirement on August 1 was announced in the *Railway Age* of July 30. **E. Rohne** will replace Mr. Ferguson at Tyler, Tex.

W. S. Hall, general superintendent of the Saskatchewan district of the Canadian Pacific, with headquarters at Moose Jaw, Sask., has been transferred to the Manitoba district with headquarters at Winnipeg, Man., succeeding **H. J. Main**, who in turn, has been transferred to Moose Jaw to replace Mr. Hall.

Walter D. Pearce, assistant superintendent on the Northern Pacific, with headquarters at St. Paul, Minn., has been promoted to superintendent of the Yellowstone division, with headquarters at Glendive, Mont., succeeding **W. W. Judson**, who has been transferred to Missoula, Mont., replacing **G. N. Slade**, who retired July 15.

Alfred O. Thor, chief clerk to the assistant general manager of the Chicago, Milwaukee, St. Paul & Pacific, with headquarters at Chicago, has been promoted to trainmaster of the Kansas City division, with headquarters at Ottumwa, Iowa, succeeding **John H. Stewart**, who has been appointed trainmaster at Beloit, Wis., a newly-created position.

Charles A. Came, acting superintendent of the Portland division of the Boston & Maine, has been appointed superintendent of that division, with headquarters at Dover, N. H., effective August 1, to succeed the late **Albert S. Twombly**. Mr. Came was born in Rochester, N. H., on May 24, 1887, and at the age of 14 worked as a train boy news agent for the Armstrong Company and Chisholm Brothers Company on the Boston & Maine, the

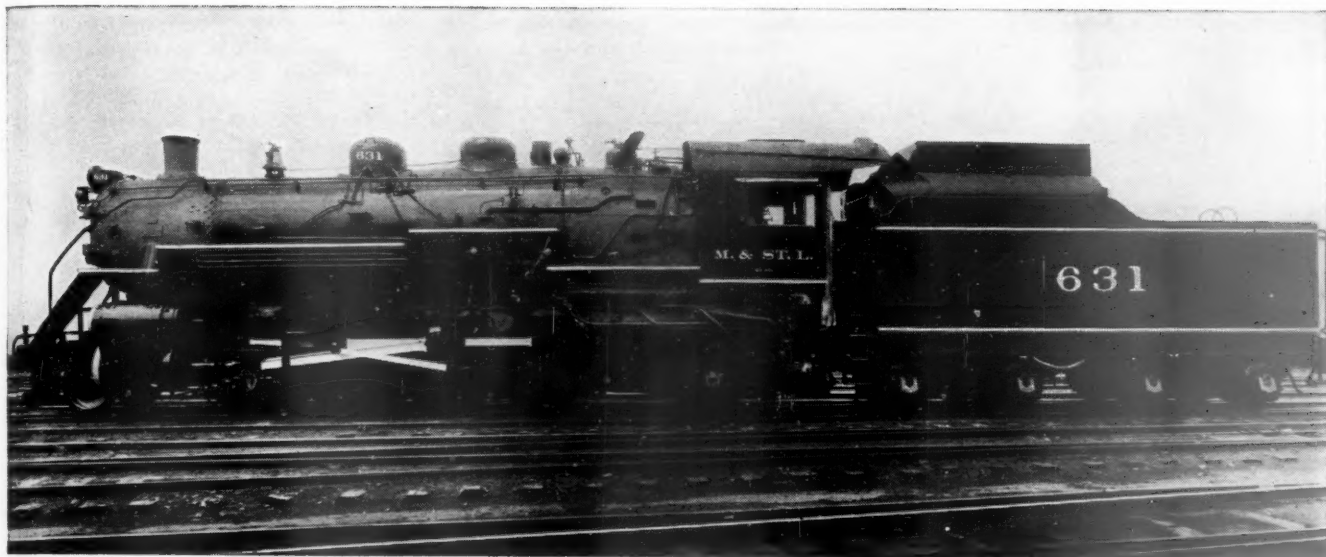


Charles A. Came

Grand Trunk, and the Maine Central. On December 8, 1905, he became an employee of the Boston & Maine, entering the serv-

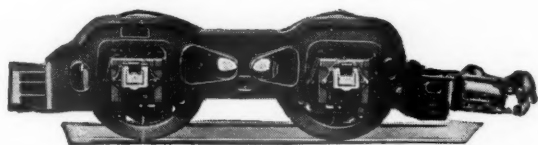
BOOSTERS

HELP BOOST INCOME



Interstate Commerce Commission reports for the first four months of 1938 reveal that the Minneapolis and St. Louis Railroad made a marked improvement in its transportation and operating ratios as compared with the same period in 1937. More efficient operation coupled with increased traffic resulted in a substantial income gain.

Modernization of Motive Power, which included application of The Locomotive Booster to increase train tonnage and accelerate traffic movement, was largely responsible in producing this gratifying result. Utilization of modern developments which reduce transportation costs and maintenance expense is inevitably reflected in improved income statements.



The close tolerances essential to efficient Booster operation call for genuine repair parts made by Franklin.

FRANKLIN RAILWAY SUPPLY COMPANY, INC.

NEW YORK

CHICAGO

MONTREAL

ice as yard brakeman in Nashua, N. H., on the Worcester, Nashua and Portland division. In 1906, he was transferred to road service on the same division, and in 1911 was promoted to freight conductor. In 1913, Mr. Came was transferred to the Portland division in the same capacity, and was promoted to trainmaster in 1919, serving in that capacity at Portsmouth, N. H., and Dover. Mr. Came has been acting superintendent since January 22.

TRAFFIC

W. D. Burch, acting general agent on the Kansas City Southern at Shreveport, La., has been promoted to general agent at that point.

Karl M. Guenther, assistant general freight agent on the Elgin, Joliet & Eastern, with headquarters at Chicago, shot and killed himself August 2 at his home in Chicago. Remorse over an automobile accident in which two young girls in another car were injured led to the suicide.

Edward E. Davies, a district agricultural inspector for the Utah State Department of Agriculture with headquarters at Cedar City, Utah, has been appointed southwestern agricultural agent of the Union Pacific with headquarters at Cedar City. Mr. Davies territory will include Utah, Nevada and California.

W. F. Nash, general agent of the Union Pacific at Riverside, Cal., has been transferred to Los Angeles, Cal., succeeding **R. E. Drummy**, whose promotion to general passenger agent at that point was announced in the *Railway Age* of July 30. **L. E. Omer**, general passenger agent at Los Angeles has been appointed special representative of the vice-president with headquarters at Omaha, Neb.

ENGINEERING AND SIGNALING

Alan T. Danver, whose appointment as chief engineer of the Rutland, with headquarters at Rutland, Vt., was reported in the *Railway Age* of July 16, was born



Alan T. Danver

on June 21, 1893, at Stamford, Conn. He was graduated from Tufts College Engineering School in 1915, with degree of

B.S. in C.E. Mr. Danver entered railroad service in July, 1915, with the Boston & Maine and served until November of that year as assistant bridge inspector. He then went with the Boston & Albany and served from November 16, 1915, to July 1, 1918, as structural draftsman; from July 1, 1918, to April 4, 1924, as structural designer; and from April 4, 1924, to June 27, 1925, as assistant engineer in charge of supervision of construction carried out by the Boston & Albany in connection with the Castleton cut-off project. On June 29, 1925, he entered the service of the Rutland as engineering assistant, and in November, 1927, he was appointed principal assistant engineer, with supervision of engineering and valuation work, which position he held until his recent appointment as chief engineer.

MECHANICAL

C. S. Perry, master mechanic of the Atlanta, Birmingham & Coast, with headquarters at Fitzgerald, Ga., has been appointed superintendent motive power, at Atlanta, Ga., succeeding **A. W. Kirkland**, who has retired from active service at his own request, effective July 31, after 45 years of railroad service.

N. M. Trapnell, mechanical engineer of the Chesapeake & Ohio, with headquarters at Richmond, Va., has been appointed assistant to superintendent motive power, with the same headquarters. **R. P. Dollard** has been appointed shop engineer; **C. W. Nelson**, electrical engineer; **J. J. Camper**, office engineer; and **D. F. Dunsmore**, road electrical foreman. **S. E. Fulks** has been appointed road foreman of engines, Handley coal sub-division, with headquarters at Handley, W. Va., succeeding **A. R. Thompson**, deceased.

OBITUARY

T. Frank Joyce, former assistant vice-president of the Boston & Maine, died on July 30 at his home in Cambridge, Mass., after a short illness, at the age of 48 years. Mr. Joyce was born at Boston, Mass., on July 24, 1890, and attended Boston University and Boston College. He began his career with the Associated Press, with which company he served from 1905 until 1923, then becoming assistant general sales manager and eastern district sales manager of the Yellow Cab Manufacturing Company. He entered railroad service in 1925 as assistant to president of the Boston & Maine at Boston, serving consecutively as publicity manager, and assistant vice-president in charge of industrial development, public relations, publicity, advertising and employees' magazine. Mr. Joyce resigned from the railroad position in 1932 to join an advertising firm.

M. A. Kinney, former superintendent of motive power of the Hocking Valley and later general master mechanic of the Chesapeake & Ohio, with headquarters at Columbus, Ohio, whose death on July 16 was announced in the *Railway Age* of July 30, was born in Ashtabula county, Ohio, and first entered railway service on October 1, 1889 as a machinist's apprentice

on the Chicago, New York & St. Louis at Conneaut, Ohio. He subsequently served the Nickel Plate as air-brake inspector, gang foreman at the Chicago shops, machine shop foreman and roundhouse foreman at Ft. Wayne, Ind. In February, 1904, he went with the Baltimore & Ohio as general roundhouse foreman at Newark, Ohio, but left that road in April, 1907 to become general foreman of the Mound Street shops of the Hocking Valley at Columbus. Later in 1907 he was promoted to master mechanic, and on September 10, 1910, he was promoted to superintendent of motive power. Mr. Kinney was appointed general master mechanic of the Chesapeake & Ohio with jurisdiction over the Hocking and Chicago divisions on May 1, 1930, following the acquisition of the Hocking Valley by the C. & O.

Harry Clifford Crowell, assistant engineer on the staff of the chief engineer of the New York zone of the Pennsylvania, with headquarters at New York, died of a stroke on July 29, at his home in Flushing, Long Island, N. Y., after an



H. C. Crowell

illness of three weeks duration. He was 55 years old. Mr. Crowell was born on September 4, 1882, in Marblehead, Mass., and attended Massachusetts Institute of Technology, from which institution he was graduated in 1903 with the degree of Bachelor of Science in civil engineering. He entered railroad service in June, 1903, as a levelman in the P. R. R. maintenance of way department at Pittsburgh, Pa., and spent his entire career in the employ of the Pennsylvania. After serving in various capacities at Pittsburgh and Loganport, Pa., he was promoted to assistant to chief engineer at Philadelphia, Pa. In 1929 he was transferred to the New York zone. Among his duties Mr. Crowell represented the Pennsylvania and Long Island railroads in many civic bodies in New York City and co-operated with the New York World's Fair 1939, Inc., in railroad matters, as well as the Eastern Presidents' Conference in connection with the railroad exhibit at the Fair. Mr. Crowell was a vice-president of the Broadway Association and was most helpful in the activities of the New York Railroad Club and the Railroad Y. M. C. A.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1938

Name of road	Av. mileage operated during period	Operating revenues				Operating expenses				Operating ratio	Net from railway operation	Net railway operating income	
		Freight	Passenger	Total	(inc. misc.)	Way and Equip-ment	Traffic	Trans-portion	Total			1938	1937
Akron, Canton & Youngstown.....	June 171	\$114,328	\$36	\$119,592		\$22,017	\$11,407	\$44,837	\$100,821	84.3	\$18,771	\$5,829	\$22,036
Alton	June 171	712,144	225	712,369		133,330	68,606	291,000	627,396	84.6	114,158	36,247	192,811
Alton	June 957	865,048	210,886	1,075,934		166,636	71,784	293,783	976,575	79.3	234,450	605,858	392,842
Alton	June 957	4,928,869	1,216,932	6,145,801		903,755	275,033	3,201,745	5,951,808	83.4	1,181,276	605,858	408,711
Atchafalaya, Topeka & Santa Fe System.....	June 13,512	11,129,125	1,584,453	12,713,578		2,170,559	420,503	5,024,817	9,179,212	66.7	4,592,290	3,517,728	3,783,468
Atlanta & West Point.....	June 13,512	54,518,477	7,850,843	62,369,320		16,485,878	2,699,428	28,356,192	58,381,678	85.2	10,123,892	2,938,038	8,955,096
Atlanta & West Point.....	June 93	22,395	128,713	151,108		18,858	7,515	61,271	122,674	95.3	6,039	3,846	15,372
Atlanta & West Point.....	June 93	509,725	139,405	649,130		112,226	48,328	382,533	759,638	97.9	16,299	43,118	124,629
Western of Alabama.....	June 133	81,389	21,949	103,338		19,101	7,438	55,319	118,222	100.2	226	13,585	9,710
Atlanta, Birmingham & Coast.....	June 639	538,756	139,735	678,491		114,303	45,547	331,301	718,988	93.2	52,370	28,694	12,359
Atlanta, Birmingham & Coast.....	June 639	235,476	56,985	292,461		52,184	22,201	109,353	250,186	97.8	17,601	45,113	27,789
Atlanta, Birmingham & Coast.....	June 639	1,350,334	140,390	1,490,724		236,749	142,891	697,033	1,352,200	93.6	105,966	42,057	197,445
Atlantic Coast Line.....	June 5,105	2,406,787	336,193	2,742,980		439,502	132,994	1,367,232	2,619,436	86.7	402,228	52,228	139,416
Atlantic Coast Line.....	June 5,105	17,618,346	4,791,586	22,409,932		2,697,325	915,981	9,754,005	18,569,509	77.7	6,283,994	3,358,994	3,899,445
Atlantic Coast Line.....	June 343	161,062	1,977	163,039		24,533	7,830	62,423	128,889	74.3	37,946	20,946	18,938
Atlantic Coast Line.....	June 343	1,066,541	6,885	1,073,426		154,836	48,243	407,430	850,937	77.4	248,772	128,772	106,137
Baltimore & Ohio.....	June 6,434	9,123,428	975,019	10,098,447		857,547	369,478	4,137,775	8,181,643	75.7	2,620,243	1,381,337	2,019,618
Baltimore & Ohio.....	June 6,434	52,157,255	5,211,976	57,369,231		14,201,994	2,234,998	26,144,432	51,560,612	83.7	10,031,529	4,653,001	2,514,320
Baltimore & Ohio.....	June 24	49,838	84,352	134,190		18,463	951	84,315	123,872	85.9	20,362	8,576	16,157
Baltimore & Ohio.....	June 24	296,590	402,846	699,436		55,945	6,873	492,777	736,257	97.7	17,137	153,846	187,924
Bangor & Aroostook.....	June 603	287,097	12,859	300,000		93,723	6,424	104,537	350,793	110.2	32,617	56,091	43,507
Bangor & Aroostook.....	June 603	3,448,930	104,207	3,553,137		544,780	34,768	890,428	2,286,022	62.5	1,372,590	987,744	1,102,753
Bangor & Aroostook.....	June 225	742,618	476	743,094		180,559	10,596	494,232	154,748	67.2	246,994	164,829	136,186
Bangor & Aroostook.....	June 225	2,525,018	3,746	2,528,764		1,171,527	70,864	796,103	2,651,396	102.6	66,415	364,322	270,706
Boston & Maine.....	June 1,960	2,204,972	577,135	2,782,107		483,260	63,865	1,358,526	2,461,593	75.5	798,244	499,438	310,649
Boston & Maine.....	June 1,960	13,300,056	3,354,045	16,654,101		3,071,474	384,697	8,679,740	15,794,730	81.7	3,543,246	1,672,681	505,225
Boston & Maine.....	June 255	110,230	18,784	129,014		16,728	5,273	48,039	99,967	73.2	36,513	28,267	20,524
Boston & Maine.....	June 255	539,692	107,135	646,827		120,855	30,101	313,183	646,296	93.5	44,620	885	62,121
Burlington, Rock Island.....	June 37	76,549	.....	76,549		40,074	418	7,969	62,084	81.00	14,565	10,370	40,038
Burlington, Rock Island.....	June 37	542,774	.....	542,774		269,845	2,486	56,907	420,952	77.46	122,438	1,704	340,234
Burlington, Rock Island.....	June 234	85,883	16,760	102,643		31,106	10,126	54,360	175,118	150.1	38,413	68,516	96,743
Burlington, Rock Island.....	June 234	1,263,809	80,647	1,344,456		277,869	59,884	507,434	1,151,779	81.2	267,333	202,905	55,196
Canadian Pacific Lines in Maine.....	June 91	50,780	8,501	59,281		17,663	4,536	52,945	101,884	149.7	33,836	40,587	60,330
Canadian Pacific Lines in Maine.....	June 91	280,867	49,384	330,251		91,230	26,386	355,816	649,984	166.0	258,349	400,298	414,670
Canadian Pacific Lines in Maine.....	June 1,926	1,002,916	88,627	1,091,543		240,725	52,323	552,395	1,083,141	89.7	124,045	12,118	32,248
Canadian Pacific Lines in Maine.....	June 1,926	5,747,113	643,252	6,390,365		1,446,678	322,665	3,383,587	6,620,162	90.6	689,719	17,575	146,057
Central of Georgia.....	June 709	1,884,473	362,165	2,246,638		407,255	44,943	1,109,487	1,794,746	74.0	629,199	234,036	100,082
Central of Georgia.....	June 709	11,154,462	2,073,870	13,228,332		785,191	289,839	6,545,424	10,485,424	73.9	3,709,728	1,346,198	446,982
Central of Georgia.....	June 430	344,811	34,472	379,283		73,257	12,087	195,857	383,371	91.2	36,942	10,087	28,120
Central of Georgia.....	June 430	1,919,353	198,606	2,117,959		423,508	75,767	1,270,517	2,313,505	98.7	29,732	128,911	354,447
Central of New Jersey.....	June 3,102	7,376,954	287,348	7,664,302		879,259	191,299	2,128,173	4,976,975	62.1	3,033,377	2,072,697	1,984,842
Central of New Jersey.....	June 3,102	43,506,143	1,538,635	45,044,778		5,487,445	1,201,940	13,054,890	31,301,951	66.9	15,471,433	10,248,700	9,946,909
Central of New Jersey.....	June 927	788,299	125,330	913,629		163,683	54,776	466,924	907,239	87.3	53,117	32,117	43,905
Central of New Jersey.....	June 927	5,291,729	707,756	6,000,485		862,696	334,242	2,952,701	5,708,644	83.9	1,092,951	618,951	153,099
Chesapeake & Ohio.....	June 131	249,145	1,024	250,169		48,995	18,248	70,218	191,982	74.4	66,111	44,412	45,786
Chesapeake & Ohio.....	June 131	1,603,665	5,692	1,609,357		163,078	115,222	421,236	1,220,852	74.0	428,805	298,644	291,185
Chesapeake & Ohio.....	June 8,391	4,952,125	118,718	5,070,843		1,338,918	200,622	2,710,554	5,818,459	85.9	956,376	346,135	102,853
Chesapeake & Ohio.....	June 8,391	27,081,667	5,290,832	32,372,499		5,775,222	1,129,821	16,909,006	34,826,472	95.8	1,534,777	2,319,252	3,465,680
Chicago & Eastern Illinois.....	June 131	5,309,540	787,549	6,097,089		1,191,477	248,611	2,623,126	5,695,033	81.9	1,242,758	510,384	142,850
Chicago & Eastern Illinois.....	June 8,270	31,472,564	4,099,939	35,572,503		5,101,047	1,484,809	16,271,833	32,459,068	88.7	7,769,474	3,376,635	1,162,265
Chicago & Eastern Illinois.....	June 1,305	1,113,668	227,451	1,341,119		225,308	52,397	181,508	1,072,413	85.5	181,508	88,133	67,815
Chicago & Eastern Illinois.....	June 1,305	7,108,707	227,451	7,336,158		1,427,159	336,438	3,379,457	6,755,653	85.3	1,146,417	603,459	446,856
Chicago, Burlington & Quincy.....	June 549	511,830	38,432	550,262		127,464	27,776	279,684	549,102	89.8	62,409	22,576	67,084
Chicago, Burlington & Quincy.....	June 549	3,222,685	284,547	3,507,232		900,436	177,420	1,797,974	3,514,508	90.7	361,440	106,329	489,568
Chicago, Indianapolis & Louisville.....	June 549

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NEW PASSENGER POWER FORTH

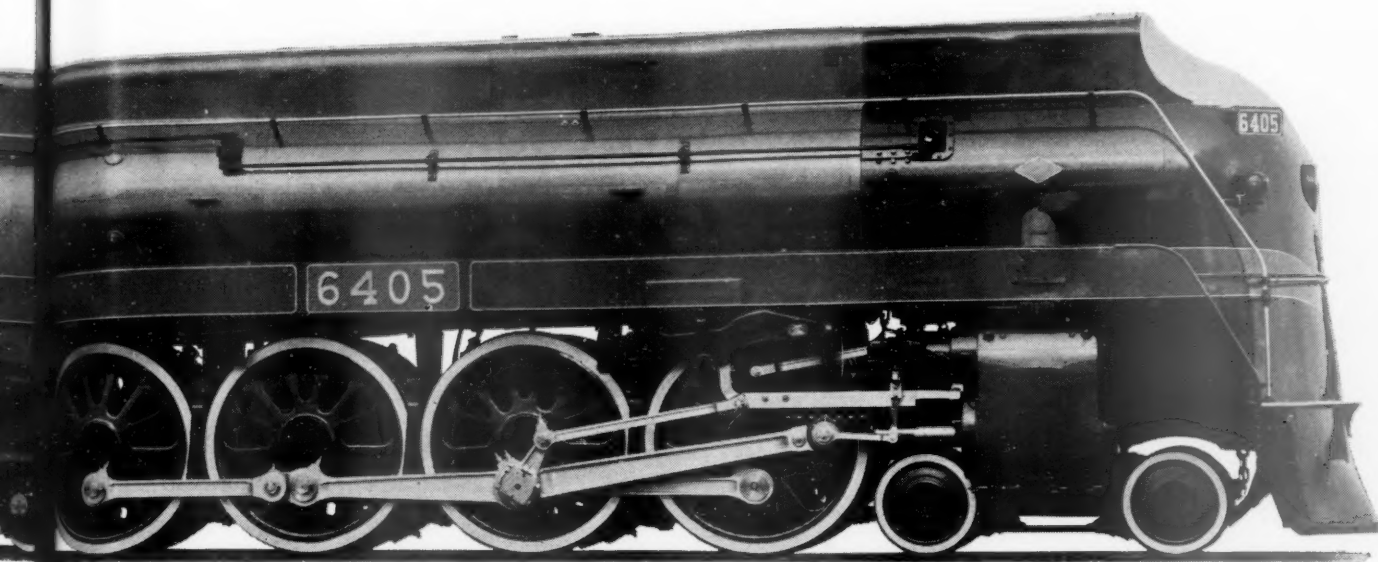


WEIGHTS IN WORKING ORDER, POUNDS				
On Drivers	Eng. Truck	Trailer Truck	Total Engine	Tender Loaded
237,900	62,000	Front 37,700 Rear 45,100	382,700	278,500
WHEEL BASE			TRACTION EFFORT	
Driving	Engine	Eng. & Tender	Main Cylinders 52,500	
20' 0"	44' 1½"	82' 8¼"		
BOILER		CYLINDERS		DRIVING WHEEL
Diameter	Pressure	Diameter	Stroke	Diameter
86"	275 lbs.	24"	30"	77"



LIMA

THE GRAND TRUNK WESTERN



The first of Six 4-8-4 type streamlined passenger locomotives now being delivered by Lima to the Grand Trunk Western.

These locomotives will be used to handle high speed passenger trains on the Grand Trunk Western, connecting with the Canadian National Railways.

LOCOMOTIVE WORKS, INCORPORATED
LIMA **OHIO**

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1938—CONTINUED

Name of road	Av. mileage operated during period	Operating revenues			Operating expenses			Operating ratio	Net from railway operation	Net railway operating income	
		Freight	Passenger (inc. misc.)	Total	Way and structures	Maintenance of equipment	Traffic			1938	1937
Chicago, Milwaukee, St. Paul & Pacific.....	June	10,952	\$6,217,615	\$709,436	\$254,195	\$1,033,128	\$254,195	88.7	\$871,608	\$119,608	\$286,912
Chicago, Milwaukee, St. Paul & Pacific.....	6 mos.	10,959	36,517,342	3,588,278	44,470,066	9,356,169	1,356,203	85.7	6,348,438	1,957,438	3,420,090
Chicago, Rock Island & Pacific.....	June	7,355	5,152,181	609,632	6,247,663	1,077,163	236,235	85.4	909,893	426,899	87,891
Chicago, Rock Island & Pacific.....	6 mos.	7,470	27,498,501	3,643,287	34,110,153	4,771,627	1,397,697	89.5	3,569,345	606,377	1,220,120
Chicago, Rock Island & Gulf.....	June	627	314,672	25,133	428,517	95,983	19,440	75.3	105,678	79,591	—10,949
Chicago, Rock Island & Gulf.....	6 mos.	627	1,570,642	227,289	372,678	223,239	116,480	75.0	568,636	417,706	—71,371
Chicago, St. Paul, Minneapolis & Omaha.....	June	1,648	1,134,201	136,595	1,382,888	308,560	40,036	92.3	108,353	—3,234	—103,955
Chicago, St. Paul, Minneapolis & Omaha.....	6 mos.	1,648	6,307,858	685,300	7,537,217	1,391,344	232,481	89.6	783,718	142,979	—435,003
Clinchfield Railroad.....	June	308	380,665	3,657	389,233	37,615	17,956	63.4	142,471	93,244	110,782
Clinchfield Railroad.....	6 mos.	308	2,730,173	21,826	2,752,000	630,217	113,282	60.2	1,082,711	808,504	882,803
Colorado & Southern.....	June	797	4,453,330	25,567	4,478,897	101,437	14,691	79.3	101,856	41,100	—44,717
Colorado & Southern.....	6 mos.	797	24,013,434	174,591	28,740,003	706,992	84,921	86.6	385,760	—58,499	—170,343
Fort Worth & Denver City.....	June	902	641,820	51,645	692,198	79,689	18,533	62.2	261,798	221,722	169,494
Fort Worth & Denver City.....	6 mos.	902	2,914,265	316,672	3,174,807	334,446	108,420	74.6	805,803	569,402	302,220
Columbus & Greenville.....	June	168	64,488	5,941	70,429	12,746	4,102	97.7	1,767	—1,915	—266
Columbus & Greenville.....	6 mos.	168	482,179	42,127	561,296	101,654	25,882	88.5	64,822	27,172	26,642
Delaware & Hudson.....	June	831	1,528,679	71,963	1,681,681	181,306	39,221	75.7	408,572	260,477	272,371
Delaware & Hudson.....	6 mos.	831	9,211,002	493,885	10,169,861	963,005	261,699	79.9	2,043,263	1,123,205	1,100,378
Delaware, Lackawanna & Western.....	June	986	2,740,196	544,726	3,758,917	395,868	1,747,539	81.0	216,033	280,739	584,097
Delaware, Lackawanna & Western.....	6 mos.	986	15,717,447	3,257,283	21,600,098	1,502,508	6,877,608	81.8	3,925,222	1,346,222	1,103,676
Denver & Rio Grande Western.....	June	2,570	1,465,551	134,787	1,717,190	373,926	66,196	99.2	13,901	—213,811	—272,551
Denver & Rio Grande Western.....	6 mos.	2,570	8,617,141	633,778	9,260,919	1,443,842	382,538	94.3	556,034	—793,925	—1,118,545
Denver & Salt Lake.....	June	232	139,206	4,722	152,708	29,771	2,241	80.5	9,722	—46,416	—9,571
Denver & Salt Lake.....	6 mos.	232	772,297	36,573	862,484	136,099	14,863	83.5	125,003	—46,416	228,759
Detroit & Mackinac.....	June	242	61,035	2,298	72,302	17,240	951	80.6	14,024	10,781	6,658
Detroit & Mackinac.....	6 mos.	242	300,762	15,107	353,866	66,851	6,141	86.9	30,756	30,756	40,183
Detroit & Toledo Shore Line.....	June	50	141,509	.....	141,509	17,818	9,140	70.1	42,376	27,610	5,268
Detroit & Toledo Shore Line.....	6 mos.	50	1,182,186	.....	1,184,932	123,333	55,801	60.0	473,625	343,548	114,242
Detroit, Toledo & Ironton.....	June	472	311,205	205	329,693	42,319	11,838	76.5	77,513	32,090	37,408
Detroit, Toledo & Ironton.....	6 mos.	472	2,350,489	1,116	2,446,043	490,980	68,227	67.2	802,124	524,799	468,724
Duluth, Missabe & Iron Range.....	June	540	1,318,685	1,579	1,526,107	174,594	4,434	42.5	87,652	894,238	893,091
Duluth, Missabe & Iron Range.....	6 mos.	540	2,439,114	9,162	2,853,055	733,250	26,287	118.1	—316,525	—815,458	—817,078
Duluth, Winnipeg & Pacific.....	June	179	79,289	1,538	83,636	30,450	41,307	125.9	—21,653	—29,291	—37,232
Duluth, Winnipeg & Pacific.....	6 mos.	179	499,006	7,678	555,552	139,981	13,752	104.2	—23,188	—70,322	—159,257
Elgin, Joliet & Eastern.....	June	435	690,620	5	799,690	97,191	14,640	90.6	75,226	—80,841	—9,202
Elgin, Joliet & Eastern.....	6 mos.	435	4,567,831	22	5,111,436	597,793	88,119	90.6	85,961	—114,363	2,538,301
Erie.....	June	2,276	4,560,883	400,744	5,468,752	790,832	173,118	85.4	798,612	231,305	1,182,425
Erie.....	6 mos.	2,276	27,018,232	2,357,256	31,913,741	3,506,332	1,022,154	85.6	4,608,678	1,250,674	8,324,251
New Jersey & New York.....	June	46	16,627	40,264	56,891	10,607	411	101.4	—825	—8,111	—19,546
New Jersey & New York.....	6 mos.	46	85,855	243,514	341,455	31,269	2,816	107.8	—26,776	—70,358	—146,770
New York, Susquehanna & Western.....	June	143	219,717	22,143	253,529	38,872	3,011	70.9	73,663	41,178	—5,292
New York, Susquehanna & Western.....	6 mos.	143	1,348,705	133,836	1,551,511	147,313	19,122	67.2	509,473	316,372	69,580
Florida East Coast.....	June	685	223,216	88,424	361,052	94,203	19,922	128.1	—101,410	—178,046	—236,701
Florida East Coast.....	6 mos.	685	3,887,422	1,876,930	6,329,496	521,687	139,380	60.8	2,480,604	1,989,634	1,519,833
Georgia Railroad.....	June	329	246,120	11,544	277,749	31,381	18,542	86.9	36,476	20,723	31,220
Georgia Railroad.....	6 mos.	329	1,458,144	66,511	1,659,138	200,751	111,665	88.7	187,704	93,839	161,465
Georgia & Florida.....	June	408	81,514	1,825	86,714	18,204	7,302	96.5	3,307	—4,760	—8,148
Georgia & Florida.....	6 mos.	408	466,211	10,173	497,354	115,487	48,501	102.7	—13,541	—59,998	—71,405
Grand Trunk Western.....	June	1,032	1,215,459	85,389	1,407,377	234,590	42,702	91.4	120,940	4,734	—91,332
Grand Trunk Western.....	6 mos.	1,032	7,150,159	499,514	8,225,452	1,271,470	263,060	100.2	—1,586	—755,961	—1,169,922
Canadian National Lines in New England.....	June	172	84,572	6,018	98,610	21,606	2,593	107.1	7,152	—22,457	—43,600
Canadian National Lines in New England.....	6 mos.	172	532,019	26,890	606,340	158,007	16,163	115.7	—94,574	—186,746	—262,716
Great Northern.....	June	8,072	4,843,231	530,762	5,963,838	534,302	205,273	66.6	1,262,966	1,262,966	1,176,719
Great Northern.....	6 mos.	8,071	25,061,368	2,947,089	29,947,089	3,205,426	1,165,462	82.5	3,233,486	1,051,593	3,805,357

Continued on next left-hand page

NO. 65 OF A SERIES OF FAMOUS ARCHES OF THE WORLD



VIADUC DE MORLAIX

FRANCE

An important link between the French capital and the Atlantic coast port of Brest, the great French naval center, is the Morlaix Viaduct, French National Railways, situated on the main line 38 miles from Brest and 288 miles from Paris. The first stage of this 291 meter concrete viaduct consists of 9 arches each of $13\frac{1}{2}$ meters, two of which can be seen in the picture. The

upper stage consists of 14 arches each of $15\frac{1}{2}$ meters.

★ ★ ★

The Security Sectional Arch, made up of small easily handled brick, is another important development in modern railroad operation. With its introduction the firebox brick arch became a practical, cost-saving factor in steam transportation.

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*Locomotive Combustion
Specialists*

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1938—CONTINUED

Name of road	Av. mileage operated during period	Operating revenues				Operating expenses				Operating ratio	Net from railway operation	Net railway operating income	
		Freight	Passenger	Total (inc. misc.)	Maintenance of way and structures	Equipment	Traffic	Trans- portation	Total			1938	1937
Green Bay & Western.....	June 234	\$123,200	\$446	\$123,646	\$23,076	\$13,730	\$6,148	\$42,001	\$91,861	71.3	\$36,919	\$15,214	\$19,556
6 mos.	234	678,623	2,927	707,947	121,434	75,503	36,049	264,319	545,172	71.3	162,777	57,739	110,096
Gulf & Ship Island.....	June 259	73,393	8,967	82,360	22,621	14,172	2,636	53,984	97,273	110.6	9,306	—37,674	19,347
6 mos.	259	534,089	41,859	645,906	122,278	89,806	16,320	344,578	603,919	93.5	41,987	—122,615	23,673
Gulf, Mobile & Northern.....	June 936	457,148	19,884	500,610	68,919	74,525	40,097	147,484	366,366	73.2	134,244	46,366	141,599
6 mos.	936	2,948,054	127,546	3,075,600	411,629	492,711	240,927	966,127	2,324,382	72.1	901,011	301,079	713,207
Illinois Central	June 4,951	5,695,693	662,485	6,358,178	758,935	1,461,699	168,496	2,759,474	5,452,830	79.1	1,440,730	779,684	1,715,678
6 mos.	4,952	34,687,364	4,497,965	42,969,081	4,141,525	8,584,142	1,014,008	17,552,627	33,189,145	77.2	9,779,936	4,965,381	5,446,514
Yazoo & Mississippi Valley.....	June 1,619	923,336	69,322	1,057,052	107,829	142,830	27,956	447,618	770,549	72.9	286,503	145,254	368,850
6 mos.	1,619	5,777,781	396,812	6,658,205	605,471	913,335	168,843	2,793,943	4,755,805	71.8	1,872,400	1,020,618	1,331,972
Illinois Central System.....	June 6,570	6,619,029	731,807	7,950,512	866,764	1,604,329	196,452	3,207,092	6,223,379	78.3	1,722,233	922,853	2,091,528
6 mos.	6,571	40,465,145	4,894,777	49,597,286	4,746,996	9,497,477	1,182,831	20,346,570	37,944,950	76.5	11,655,336	6,777,907	8,841,286
Illinois Terminal	June 496	316,192	55,168	410,992	55,058	66,450	15,371	157,000	311,133	75.70	99,859	54,408	114,378
6 mos.	496	1,916,409	358,484	2,493,263	289,049	399,585	95,135	956,668	1,846,751	74.07	646,512	363,030	720,088
Kansas City Southern.....	June 879	972,993	20,547	1,001,939	116,606	148,597	50,530	317,191	694,735	63.0	407,204	305,204	249,407
6 mos.	879	5,823,347	105,790	6,630,145	681,183	895,941	303,032	1,980,872	4,239,157	63.9	2,390,988	1,460,150	1,410,553
Kansas, Oklahoma & Gulf.....	June 327	180,480	430	183,727	20,068	17,981	8,538	42,946	96,390	52.5	87,337	70,872	70,131
6 mos.	327	1,085,985	2,702	1,111,053	105,033	111,097	54,444	269,582	592,984	53.4	518,069	414,349	329,111
Lake Superior & Ishpeming.....	June 156	98,024	36	98,060	36,336	11,097	671	28,494	88,483	74.4	30,435	8,885	202,694
6 mos.	156	308,178	362	341,907	160,068	155,406	4,179	145,628	503,560	147.9	—163,653	—304,996	462,944
Lehigh & Hudson River.....	June 96	114,884	233	115,801	8,808	17,660	3,513	40,930	77,458	66.9	38,343	23,789	13,629
6 mos.	96	682,230	917	686,962	51,438	127,705	22,933	258,262	490,401	72.7	187,961	110,694	108,242
Lehigh & New England.....	June 203	382,237	.....	382,237	36,668	60,887	7,860	111,134	229,597	59.7	135,119	116,927	75,359
6 mos.	209	1,691,791	.....	1,691,791	189,859	378,370	42,535	610,642	1,305,899	76.6	399,660	273,253	469,611
Lehigh Valley	June 1,307	3,029,205	170,327	3,423,049	203,814	705,561	109,303	1,446,899	2,596,032	75.8	827,017	531,176	310,688
6 mos.	1,307	17,611,967	1,091,348	19,997,882	1,234,506	3,907,744	674,315	9,239,958	15,752,633	78.8	4,243,249	2,499,107	1,340,046
Louisiana & Arkansas.....	June 606	470,468	8,194	495,231	76,950	70,326	30,173	128,778	323,587	65.3	171,644	128,649	94,222
6 mos.	606	2,722,230	57,012	2,894,644	391,055	432,223	190,723	812,950	1,950,746	67.4	943,898	692,890	571,328
Louisiana, Arkansas & Texas.....	June 240	101,265	148	106,565	38,889	14,774	4,304	39,480	91,291	85.7	15,274	10,356	17,453
6 mos.	240	544,053	880	571,240	151,844	81,184	29,479	238,716	518,359	90.7	52,881	22,212	28,301
Louisville & Nashville.....	June 4,938	5,130,138	490,348	6,001,070	693,814	1,336,992	152,632	2,329,616	4,771,434	79.5	1,229,616	667,317	1,349,612
6 mos.	4,938	30,950,310	3,116,592	36,817,753	4,084,114	8,466,349	1,123,484	14,633,056	29,992,026	81.5	6,823,727	3,414,990	8,293,128
Maine Central	June 996	647,987	98,474	831,419	141,510	121,275	11,868	336,108	646,232	77.7	185,187	111,998	137,028
6 mos.	1,003	4,783,501	455,867	5,715,637	919,114	1,006,453	68,760	2,208,421	4,415,842	77.3	1,299,795	883,678	586,360
Midland Valley	June 352	98,262	3	99,878	16,028	9,413	2,337	27,053	60,791	60.9	39,087	27,346	30,080
6 mos.	352	580,053	41	590,764	80,579	76,370	15,493	172,152	380,071	64.3	210,693	138,356	107,787
Minneapolis & St. Louis.....	June 1,523	644,179	8,844	688,934	116,289	118,392	44,032	260,028	572,029	83.0	116,905	72,638	123,387
6 mos.	1,523	3,748,231	53,054	4,001,869	575,537	728,901	260,296	1,652,278	3,419,971	85.5	581,898	320,809	107,221
Minneapolis, St. Paul & Sault Ste. Marie.....	June 4,297	1,738,794	123,591	2,030,945	376,322	344,118	62,698	862,312	1,734,829	85.4	296,116	117,235	491,749
6 mos.	4,298	9,333,531	492,179	10,775,463	1,648,802	2,231,125	363,382	5,388,545	10,155,257	94.2	620,206	—449,708	801,765
Duluth, South Shore & Atlantic.....	June 549	116,680	11,677	144,892	41,333	27,540	4,077	69,135	147,670	101.9	—2,778	—15,141	70,087
6 mos.	549	693,688	67,595	841,893	202,124	185,415	26,103	451,410	886,518	105.3	—44,625	—152,051	251,223
Spokane International	June 164	62,280	999	63,279	21,348	7,081	2,110	21,500	36,511	81.1	13,214	7,924	18,266
6 mos.	164	292,158	7,140	335,061	89,778	46,056	12,867	128,666	305,649	91.2	29,432	—1,379	30,255
Mississippi Central	June 150	59,527	1,564	63,077	11,382	9,222	6,567	18,532	50,451	88.0	12,626	8,039	—813
6 mos.	150	354,863	10,627	378,314	71,548	60,166	43,122	128,596	332,731	80.0	45,578	17,508	5,389
Missouri & Arkansas.....	June 365	56,412	1,132	63,390	21,527	10,122	4,831	25,692	66,515	104.9	—3,125	—7,279	—7,209
6 mos.	365	420,215	8,747	460,417	128,292	66,915	31,554	176,415	428,953	93.2	31,464	7,363	—36,887
Missouri-Illinois	June 193	64,073	378	66,088	21,528	11,846	2,581	24,379	64,464	97.5	1,624	—4,555	32,179
6 mos.	193	486,246	2,769	499,243	102,039	79,268	16,869	186,499	415,227	83.2	4,016	45,737	16,856
Missouri-Kansas-Texas Lines	June 3,294	1,890,368	204,721	2,322,830	357,724	360,728	109,221	914,949	1,872,085	80.6	450,745	22,806	474,804
6 mos.	3,294	10,637,915	1,036,721	13,017,435	1,985,989	2,226,905	669,929	5,131,977	11,218,510	86.2	1,998,925	754,284	1,627,082
Missouri Pacific	June 7,175	5,133,597	387,987	6,101,619	1,127,410	1,179,227	239,618	2,404,850	5,204,996	85.3	896,623	402,888	430,447
6 mos.	7,175	31,112,542	2,447,372	37,077,250	5,561,670	7,483,844	1,443,248	15,160,571	31,267,598	84.3	5,809,652	2,858,942	4,199,074

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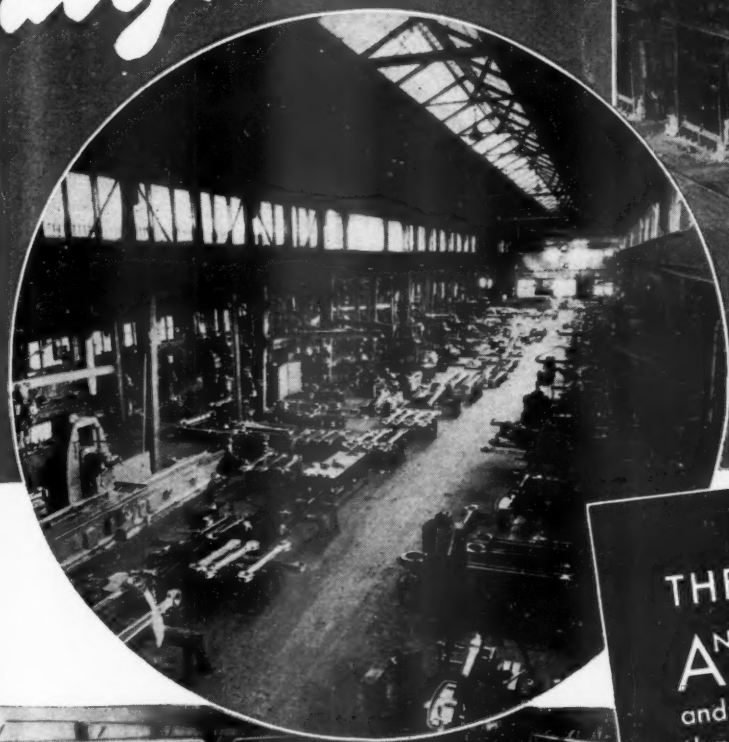
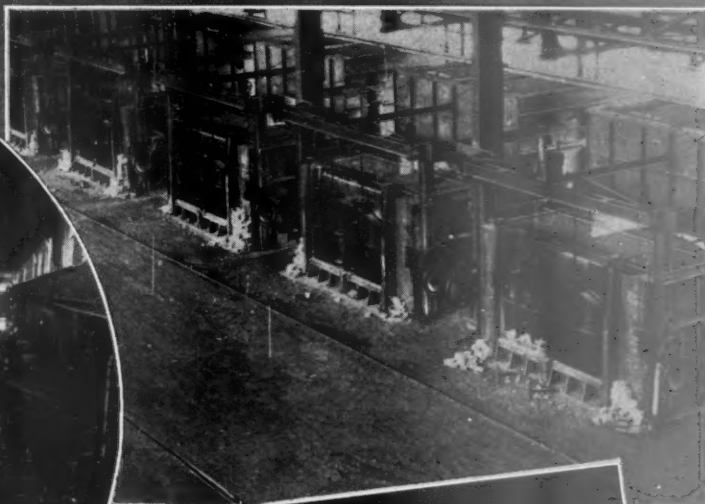
REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1938—CONTINUED

Name of road	Av. mileage operated during period	Operating revenues				Operating expenses				Operating ratio	Net from operation	Net railway operating income	
		Freight	Passenger	Total (inc. misc.)	Way and structures	Maintenance of Equip-ment	Traffic	Trans- portation	Total			1938	1937
Gulf Coast Lines.....	June 1,767	\$728,871	\$37,012	\$821,298	\$182,678	\$194,849	\$45,917	\$324,495	\$798,240	97.19	\$23,058	—\$48,457	\$11,981
.....	6 mos. 1,767	7,680,852	239,728	8,268,740	1,161,430	1,145,186	277,630	2,521,002	5,971,119	65.27	2,871,621	2,430,204	2,479,266
International Great Northern.....	June 1,155	774,477	73,548	954,843	159,531	194,852	29,975	436,329	870,603	92.18	74,240	15,000	21,513
.....	6 mos. 1,155	4,867,253	451,740	5,954,723	909,224	1,168,639	190,057	2,731,525	5,326,227	89.45	628,496	268,508	20,732
Mobile & Ohio.....	June 1,194	775,416	25,696	827,888	111,136	144,063	41,084	237,923	667,014	79.6	170,874	110,895	119,435
.....	6 mos. 1,194	5,148,269	154,532	5,609,068	693,170	998,758	234,661	2,312,413	4,450,993	79.4	1,158,055	724,668	722,753
Monongahela.....	June 1,172	282,236	1,085	284,954	118,920	19,183	436	38,143	100,496	35.3	184,458	134,130	87,570
.....	6 mos. 1,172	1,497,139	4,395	1,511,333	125,946	114,843	2,966	373,889	637,369	42.2	873,964	691,132	670,090
Montour.....	June 56	124,510	.....	126,110	10,247	35,285	947	30,075	83,071	65.9	43,039	22,429	124,041
.....	6 mos. 56	665,085	.....	674,173	55,390	213,527	5,920	199,333	513,021	76.1	161,152	65,088	506,639
Nashville, Chattanooga & St. Louis.....	June 1,116	860,222	76,554	1,037,791	113,539	200,849	60,500	438,223	868,750	83.7	169,041	94,025	37,601
.....	6 mos. 1,116	5,338,711	556,586	6,621,268	725,296	1,151,726	394,681	2,772,101	5,392,899	81.4	1,228,369	773,622	715,287
Nevada Northern.....	June 166	37,854	955	43,275	8,657	2,800	1,225	8,532	25,917	59.9	17,358	6,635	9,907
.....	6 mos. 166	218,370	7,140	236,466	47,486	20,115	7,380	60,227	165,204	64.4	91,262	38,942	117,430
New York Central.....	June 11,077	14,965,010	5,323,935	23,040,069	2,612,860	4,332,865	587,285	9,461,772	18,230,360	79.1	4,809,709	1,923,301	2,229,247
.....	6 mos. 11,077	92,961,779	29,138,295	138,942,439	14,845,226	28,448,059	3,313,359	60,997,426	115,211,005	82.9	23,731,434	6,262,399	108,187
Pittsburgh & Lake Erie.....	June 233	1,018,773	38,747	1,103,070	116,377	337,588	27,252	391,064	950,436	86.2	152,634	20,453	190,073
.....	6 mos. 233	5,257,857	263,509	5,787,769	594,900	2,108,108	169,131	2,568,226	5,922,655	102.3	—134,886	—817,711	235,066
New York, Chicago & St. Louis.....	June 1,704	2,596,233	75,682	2,773,682	293,006	476,206	121,482	1,053,242	2,062,300	74.4	711,382	512,863	284,764
.....	6 mos. 1,704	15,674,095	409,217	16,690,873	1,764,409	2,840,035	720,032	6,781,757	12,821,061	76.8	3,869,812	2,638,911	1,176,049
New York, New Haven & Hartford.....	June 2,020	3,111,655	2,130,264	5,858,061	948,684	1,004,261	123,754	2,447,484	4,871,781	83.2	986,280	486,280	440,490
.....	6 mos. 2,020	18,281,442	12,627,547	34,702,358	4,741,637	6,473,263	641,085	15,148,825	29,228,815	84.2	5,473,543	2,413,543	659,996
New York Connecting.....	June 21	241,188	.....	249,084	28,328	8,217	.....	27,306	65,235	26.2	183,849	141,998	37,269
.....	6 mos. 21	1,048,149	.....	1,094,132	93,400	66,561	.....	182,015	349,703	32.0	744,429	507,167	794,868
New York, Ontario & Western.....	June 576	513,640	29,368	592,846	78,802	127,060	14,367	257,099	501,609	84.6	91,237	37,653	—19,542
.....	6 mos. 576	2,440,552	82,450	3,097,596	406,666	768,242	84,863	1,565,046	2,980,051	96.2	117,545	—201,624	806
Norfolk & Western.....	June 2,200	5,103,001	168,663	5,451,231	624,799	1,260,612	133,998	1,478,636	3,692,089	67.7	1,759,142	1,017,572	2,774,887
.....	6 mos. 2,200	30,326,097	916,347	32,338,947	4,056,751	7,603,651	836,483	9,239,934	22,883,845	70.8	9,455,102	4,472,915	16,441,219
Norfolk Southern.....	June 809	577,525	4,238	594,543	62,737	51,785	22,759	156,314	317,603	53.4	276,930	241,445	228,342
.....	6 mos. 809	2,160,403	24,497	2,277,620	379,811	312,187	143,774	827,010	1,807,518	79.4	470,102	263,820	330,632
Northern Pacific.....	June 6,721	3,656,192	481,046	4,582,154	851,048	917,508	192,486	1,728,038	3,981,981	86.9	600,173	8,732	285,292
.....	6 mos. 6,721	19,947,169	1,872,042	24,245,075	3,629,179	5,717,882	1,072,947	10,625,954	22,713,897	93.7	1,531,178	—1,933,874	1,684,088
Northwestern Pacific.....	June 332	190,628	58,088	276,274	85,470	49,889	2,860	165,704	316,446	114.5	—40,172	—59,481	—2,316
.....	6 mos. 332	845,970	290,025	1,269,293	470,389	295,580	23,258	960,494	1,823,788	143.7	—534,495	—667,089	—66,494
Oklahoma City-Ada-Atoka.....	June 132	30,937	337	33,224	9,110	3,954	896	10,752	26,841	80.8	6,383	3,057	10,688
.....	6 mos. 132	200,246	2,140	213,294	48,939	15,364	5,232	66,832	148,745	69.7	64,349	45,745	35,440
Pennsylvania.....	June 10,306	21,003,806	5,232,004	29,017,280	2,300,688	4,973,403	667,510	10,733,229	19,876,978	68.5	9,140,302	5,856,234	6,534,152
.....	6 mos. 10,306	118,525,233	32,238,390	167,524,652	16,363,367	31,070,864	3,993,715	66,747,519	135,698,581	75.0	41,828,071	23,428,532	37,595,550
Long Island.....	June 394	525,718	337	526,055	146,671	307,086	8,533	924,561	1,436,084	70.6	596,701	222,867	57,379
.....	6 mos. 394	2,961,724	7,378,033	10,842,187	959,061	1,847,479	41,812	5,684,411	8,739,687	80.6	2,106,500	581,868	—220,344
Pennsylvania-Reading Seashore Lines.....	June 412	205,255	214,496	440,222	75,697	63,370	7,923	274,322	437,376	99.4	2,846	—85,180	—134,230
.....	6 mos. 412	1,211,011	823,631	2,147,114	440,067	451,086	43,237	1,596,601	2,628,694	122.4	—481,580	—937,358	—1,130,085
Pere Marquette.....	June 2,115	1,633,447	79,898	1,842,343	313,849	483,396	63,190	779,388	1,732,080	94.0	110,263	43,213	345,136
.....	6 mos. 2,115	10,328,805	417,238	11,377,099	1,791,884	2,775,658	379,615	5,040,943	10,563,983	92.8	813,716	—103,972	2,560,460
Pittsburgh & Shawmut.....	June 101	34,090	.....	34,382	13,049	11,736	1,683	11,657	42,076	122.3	—7,694	—9,218	9,188
.....	6 mos. 101	238,864	947	242,590	58,354	95,228	9,816	88,554	280,282	115.5	—37,692	—47,306	13,889
Pittsburgh & West Virginia.....	June 136	207,094	.....	223,931	33,502	55,442	15,816	54,951	181,778	81.2	54,153	22,587	150,639
.....	6 mos. 136	1,223,187	.....	1,325,921	192,059	312,987	96,901	347,249	1,081,524	81.6	244,397	149,975	680,495
Pittsburgh, Shawmut & Northern.....	June 190	64,227	.....	64,599	14,439	10,410	917	22,810	54,273	84.0	10,326	5,649	—32,123
.....	6 mos. 190	417,446	.....	421,691	79,398	72,875	6,437	159,880	354,175	84.1	66,976	—12,384	—17,572
Feading.....	June 1,451	3,584,775	244,272	4,000,389	223,287	739,434	77,777	1,663,923	2,852,409	71.3	1,147,980	803,034	1,460,366
.....	6 mos. 1,451	20,834,779	1,597,185	23,532,222	1,381,789	4,860,208	461,050	10,429,970	18,040,812	76.7	5,491,410	3,718,148	3,896,020
Richmond, Fredericksburg & Potomac.....	June 118	379,157	129,733	591,017	72,560	135,387	9,202	238,171	491,770	83.2	99,247	50,813	23,864
.....	6 mos. 118	2,231,528	1,318,230	4,166,092	415,176	818,229	57,960	1,755,150	3,336,198	80.1	829,894	524,222	705,263

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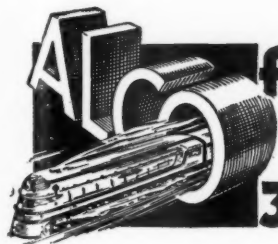
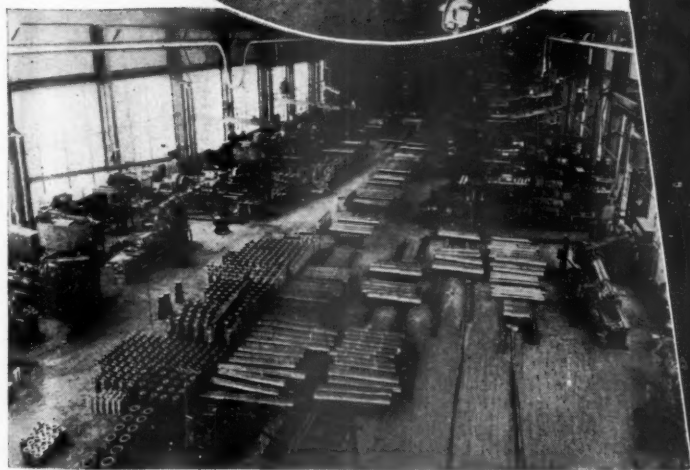
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AMERICAN LOCOMOTIVE COMPANY

30 CHURCH STREET • NEW YORK • N.Y.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1938—CONTINUED

Name of road	Av. mileage operated during period	Operating revenues			Maintenance of way and structures			Operating expenses			Operating ratio	Net from railway operation	Net railway operating income	
		Freight	Passenger	Total (inc. misc.)	Way and structures	Traffic	Transportation	Total	Operating income	1938			1937	
Rutland	407	\$160,497	\$21,909	\$239,456	\$38,829	\$10,409	\$133,881	\$251,653	105.1	\$41,369	\$42,171	\$4,506		
St. Louis-San Francisco	4,885	9,111,920	161,471	1,399,498	216,428	64,560	851,451	1,590,582	113.7	366,520	371,173	30,030		
St. Louis-San Francisco	4,885	3,217,595	297,984	3,808,040	618,072	111,300	1,414,960	3,257,633	85.5	550,407	550,407	722,699		
St. Louis, San Francisco & Texas	266	198,067	362	204,464	23,535	17,002	57,872	113,131	55.3	91,333	82,920	28,713		
St. Louis, San Francisco & Texas	266	761,814	2,961	797,922	144,513	87,523	336,265	654,696	82.1	143,226	94,361	204,613		
St. Louis Southwestern Lines	1,706	1,467,638	24,989	1,553,127	216,629	80,318	511,398	1,098,202	70.7	454,925	349,705	4,515		
St. Louis Southwestern Lines	1,706	8,389,541	134,099	8,894,208	1,287,551	486,944	3,283,716	6,712,078	75.7	2,182,132	1,554,785	861,242		
Seaboard Air Line	4,318	2,244,197	278,766	2,778,526	530,502	662,094	1,162,031	2,671,404	96.1	107,122	117,878	112,639		
Seaboard Air Line	4,318	15,970,162	3,035,543	21,091,881	2,890,756	4,194,571	1,010,507	8,135,393	82.4	3,706,488	1,846,488	2,956,263		
Southern Railway	6,602	5,397,940	739,795	6,697,164	910,681	148,775	2,509,344	5,144,337	76.8	1,552,827	926,548	607,369		
Southern Railway	6,602	33,513,802	4,256,956	41,294,388	5,459,933	925,821	15,903,773	31,846,444	77.1	9,447,944	5,670,141	9,267,498		
Alabama Great Southern	315	432,703	52,697	519,549	85,889	131,947	11,660	156,725	78.5	111,629	90,455	92,421		
Alabama Great Southern	315	2,501,695	278,698	3,008,819	512,261	72,139	1,017,149	2,519,531	83.7	489,288	196,747	639,763		
Cincinnati, New Orleans & Texas Pacific	337	1,047,054	24,009	1,188,811	173,238	263,217	301,038	813,289	68.4	375,522	271,598	451,264		
Cincinnati, New Orleans & Texas Pacific	337	6,040,706	625,815	7,118,789	1,029,211	1,580,868	1,961,048	5,057,941	71.1	2,060,848	1,369,631	2,586,734		
Georgia Southern & Florida	398	98,941	19,819	133,750	28,669	35,662	2,001	66,172	102.9	3,926	22,929	7,571		
Georgia Southern & Florida	398	597,107	302,103	1,021,787	190,319	11,340	475,935	935,137	91.5	86,650	16,601	156,882		
New Orleans & Northeastern	204	1,257,634	106,451	1,460,497	217,137	37,455	482,339	1,029,346	66.5	84,605	53,932	47,045		
New Orleans & Northeastern	204	1,257,634	106,451	1,460,497	217,137	37,455	482,339	1,029,346	70.5	431,151	248,100	305,403		
Northern Alabama	100	29,959	1,087	32,545	13,169	1,164	13,211	30,847	94.8	1,698	3,906	1,583		
Northern Alabama	100	250,786	6,854	266,702	59,909	7,010	97,517	185,303	69.5	81,399	47,250	69,927		
Southern Pacific	8,716	9,743,117	2,266,697	13,347,341	1,516,763	331,143	4,968,977	9,939,461	74.5	3,407,880	2,134,953	3,361,652		
Southern Pacific	8,716	52,310,180	10,518,945	69,376,875	8,837,584	2,096,315	29,687,467	58,545,549	84.4	10,831,326	3,622,674	5,941,959		
Southern Pacific Steamship Lines	4,416	480,107	30,215	532,786	13,386	89,026	17,977	386,069	98.0	10,854	4,917	37,652		
Southern Pacific Steamship Lines	4,416	2,899,417	138,044	3,190,439	85,191	592,040	106,210	2,401,463	103.0	96,194	189,530	49,382		
Texas & New Orleans	4,416	2,682,523	310,837	3,278,261	525,047	588,217	123,862	2,676,322	81.6	601,939	299,208	106,449		
Texas & New Orleans	4,416	17,000,177	1,630,309	20,328,362	3,124,374	3,813,391	735,840	7,514,409	81.1	3,835,016	1,985,124	2,639,038		
Spokane, Portland & Seattle	947	503,025	57,765	610,009	138,636	82,234	11,738	225,569	80.1	121,576	44,329	224,764		
Spokane, Portland & Seattle	947	3,089,620	222,569	3,583,764	657,937	527,257	60,011	1,450,070	80.1	714,086	277,360	863,910		
Tennessee Central	287	128,650	5,042	142,309	27,538	20,989	5,556	58,030	85.7	20,322	8,893	18,611		
Tennessee Central	287	947,149	24,581	1,028,823	180,466	35,864	398,251	833,649	81.0	195,174	123,639	31,743		
Texas & Pacific	1,937	1,764,050	218,117	2,157,593	212,914	369,466	71,301	732,907	69.3	661,553	522,592	522,568		
Texas & Pacific	1,937	10,273,215	1,221,738	12,566,624	1,304,544	2,166,519	440,236	8,964,726	71.3	3,601,898	2,719,755	3,054,196		
Texas Mexican	162	55,520	351	70,304	11,356	10,613	33,224	63,079	89.7	7,225	609	33,679		
Texas Mexican	162	474,472	2,957	554,872	87,502	88,146	19,065	458,053	82.6	96,819	78,012	47,876		
Toledo, Peoria & Western	239	164,997	18	168,401	48,395	13,558	16,066	37,721	77.2	38,315	29,232	10,077		
Toledo, Peoria & Western	239	1,011,934	21	1,026,641	268,409	7,635	99,027	246,444	73.6	271,235	193,290	131,825		
Union Pacific System	9,909	8,090,170	1,827,752	11,134,980	1,400,994	394,268	3,827,691	8,461,598	76.0	2,673,382	1,388,836	1,190,712		
Union Pacific System	9,912	48,634,479	7,596,682	62,300,119	6,113,373	2,095,740	23,043,590	47,424,949	76.1	14,875,170	7,364,234	3,853,117		
Utah	111	26,746	.....	26,805	9,319	338	9,129	37,114	138.5	10,309	13,422	9,234	
Utah	111	271,532	.....	272,185	60,262	106,613	1,698	279,990	102.9	7,805	50,728	38,923	
Virginian	638	1,408,316	2,743	1,408,322	135,759	336,642	23,187	765,046	52.3	698,276	523,276	715,703		
Virginian	622	8,583,425	17,730	8,924,823	859,817	136,822	1,515,900	4,784,980	53.6	4,139,843	3,019,843	4,457,341		
Wabash	2,434	2,633,867	212,589	3,082,150	409,891	524,971	148,650	1,314,533	82.8	382,250	382,250	220,995		
Wabash	2,434	16,116,300	1,554,260	18,669,947	2,391,705	3,342,213	893,160	15,880,614	85.1	2,780,076	1,520,614	2,607,223		
Ann Arbor	294	263,653	3,456	277,138	31,771	58,485	119,159	235,943	85.1	41,251	21,188	8,557		
Ann Arbor	294	1,572,515	15,992	1,635,143	164,832	379,689	77,873	1,473,531	90.1	161,612	42,381	190,110		
Western Maryland	879	970,700	10,319	1,013,324	152,188	257,832	295,065	777,721	76.7	235,603	163,982	318,344		
Western Maryland	879	6,153,192	40,358	6,422,893	780,593	1,066,708	1,906,831	4,646,668	72.3	1,331,497	1,331,497	2,403,769		
Western Pacific	1,208	1,095,375	42,336	1,190,028	460,563	208,224	63,615	1,227,439	103.1	37,411	124,733	202,056		
Western Pacific	1,208	5,604,364	142,835	5,938,245	2,133,890	1,392,500	2,892,086	7,063,624	119.0	1,125,379	1,668,323	2,004,034		
Wheeling & Lake Erie	513	828,610	1,383	879,501	79,751	167,251	33,265	614,460	69.9	265,041	152,524	498,962		
Wheeling & Lake Erie	513	4,322,291	10,151	4,526,150	444,035	1,066,640	1,777,739	3,646,915	80.6	879,235	321,603	2,545,755		